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# COMMONWEALTH of VIRGINIA

## **2013 Clean Water Act Section 319 Nonpoint Source Pollution Management Program Annual Report**

**and**

## **2013 Progress Report on the ‘Chesapeake Bay and Virginia Waters Cleanup Plan’**

**July 1, 2012 – June 30, 2013**

## **Supplement: TMDL Watershed Implementation Progress Summary**

**February 2014**

Department of Environmental Quality  
Division of Water  
629 E. Main Street Richmond, VA 23219-2405  
PO Box 1105, Richmond VA 23218-1105



## TABLE OF CONTENTS

### INTRODUCTION: NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM

NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM.....	III
FEDERAL CLEAN WATER ACTION – SECTION 319 – NONPOINT SOURCE POLLUTION .....	III
CHESAPEAKE BAY AND VIRGINIA WATERS CLEAN-UP AND OVERSIGHT ACT OF 2006 ( HB1150).....	III
WATER QUALITY INFORMATION AND RESTORATION ACT OF 1987 (WQMIRA).....	III
VIRGINIA WATER QUALITY IMPROVEMENT ACT OF 1997 (WQIF) .....	IV
SUMMARY AND CONTENT OF THE 2012 VA NPS MANAGEMENT PROGRAM ANNUAL REPORT .....	IV

### 2012 SUPPLEMENTAL REPORT: TMDL IMPLEMENTATION PROGRESS SUMMARY

#### CHAPTER 1: TMDL IMPLEMENTATION PROGRAM SUMMARY REPORT

BACKGROUND OF TMDL IMPLEMENTATION PROGRAM .....	1
TMDL IMPLEMENTATION PLANS.....	1
WATERSHED RESTORATION AND TMDL IMPLEMENTATION .....	4
FEDERAL SECTION 319 PROJECTS .....	4
STATE FUNDED WQIF TARGETED TMDL PROJECTS .....	4
VIRGINIA'S TMDL IMPLEMENTATION PROGRAM IN 2012.....	5
FUNDING OF IMPLEMENTATION.....	7
BMP IMPLEMENTATION AND POLLUTION REDUCTIONS .....	9
WATER QUALITY IMPROVEMENTS, WATERSHED RESTORATION, DELISTING AND FUTURE ACTIONS.....	11

#### CHAPTER 2: PROGRESS REPORTS FOR TMDL IMPLEMENTATION PROJECTS

CONTENTS.....	12
<b><i>Federal Section 319(h) TMDL Implementation: Current Projects</i></b>	
BIG OTTER RIVER PROJECT: JULY 2006-JUNE 2013.....	13
UPPER HAZEL RIVER PROJECT: JULY 2009-JUNE 2013 .....	14
LOONEY CREEK PROJECT: JULY 2009-JUNE 2013.....	15
MILL AND HAWKSBILL CREEKS PROJECT: JANUARY 2008-JUNE 2013 .....	16
THUMB, DEEP, CARTER AND GREAT RUNS PROJECT: JULY 2006-JUNE 2013 .....	17
WILLIS RIVER PROJECT: JULY 2005-JUNE 2013 .....	18
SLATE RIVER PROJECT: JULY 2011-JUNE 2013.....	20
MOORES CREEK PROJECT: JANUARY 2012-JUNE 2013.....	22
SMITH CREEK PROJECT: JANUARY 2012-JUNE 2013.....	23
CRAIG, BROWN AND MARSH RUNS PROJECT: JANUARY 2012-JUNE 2013 .....	24
HAYS CREEK WATERSHED PROJECT: OCTOBER 2012-JUNE 2013.....	25
UPPER YORK RIVER WATERSHED PROJECT: OCTOBER 2012-JUNE 2013.....	26

**Other TMDL Implementation Projects**

ROBINSON RIVER AND LITTLE DARK RUN.....	27
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**WQIF Targeted TMDL Implementation Projects:**

CHRISTIANS CREEK AND SOUTH RIVER TMDL IMPLEMENTATION PROJECT.....	28
MOFFETT CREEK, MIDDLE RIVER AND POLECAT DRAFT TMDL IMPLEMENTATION PROJECT .....	29
MOSSY CREEK, LONG GLADE RUN AND NAKED CREEK TMDL IMPLEMENTATION PROJECT.....	30
FALLING RIVER TMDL IMPLEMENTATION PROJECT.....	31
PIGG RIVER TMDL IMPLEMENTATION PROJECT (BLUE RIDGE SWCD) .....	32
PIGG RIVER TMDL IMPLEMENTATION PROJECT (PITTSYLVANIA SWCD).....	33
FLAT, NIBBS, DEEP AND WEST CREEKS TMDL IMPLEMENTATION PROJECT.....	34
SPRING, BRIERY AND SAYLERS CREEKS, LITTLE SANDY AND BUSCH RIVERS TMDL IMPLEMENTATION PROJECT.....	35
CUB, TURNIP AND BUFFALO CREEKS TMDL IMPLEMENTATION PROJECT .....	36
SOUTHERN RIVERS LIVESTOCK EXCLUSION TMDL IMPLEMENTATION PROJECT.....	37

<b>GLOSSARY OF ACRONYMS .....</b>	<b>38</b>
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## **INTRODUCTION: NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM**

### ***Nonpoint Source Pollution Management Program***

Virginia's Nonpoint Source Pollution (NPS) Management Program is a diverse network of state and local government programs. Collectively, these programs help prevent water quality degradation and restore the health of our lakes, rivers, streams and estuaries by promoting and funding state and local watershed planning efforts, stream and wetland restoration and protection, education and outreach, and other measures to reduce and prevent NPS pollution from impacting waters of the Commonwealth. Statewide NPS pollution control programs and services support both individual natural resource stewardship and assist local governments with resource management. These statewide programs are funded through state agency budgets, non-general fund revenues and federal and non-federal grant programs. There are several state and federal laws that result in comprehensive programs that address the management of NPS pollution in the Commonwealth of Virginia. Collectively these state and federal programs and laws make up the legislative backdrop to Virginia's comprehensive NPS Pollution Management Program.

### ***Federal Clean Water Act – Section 319 – Nonpoint Source Pollution***

Section 319 of the Federal Clean Water Act (CWA) requires that states develop and implement NPS pollution management programs. Section 10.1-104.1 of the Code of Virginia designated DCR as the lead agency for the Commonwealth's NPS pollution management program. During its 2013 Legislative Session, the General Assembly passed Chapters 756 (HB2048) and 793 (SB1279) of the 2013 Virginia Acts of Assembly which designated, effective July 1, 2013, the Virginia Department of Environmental Quality (DEQ) as the lead for nonpoint source programs in the Commonwealth of Virginia (Section 10.1-104.1 of the Code of Virginia). DEQ is responsible for distribution of funds, identification and establishment of priorities of NPS related water quality problems, and the administration of an NPS advisory committee. In 1999, the EPA approved Virginia's NPS Pollution Management Program Plan. In 2006, state legislation was passed (House Bill 1150) directing the Commonwealth to develop a plan to address water quality impairments and protect the waters from further degradation. In 2008, it was decided that the plan established by this new legislation, the "Chesapeake Bay and Virginia Waters Clean-up Plan," (referenced as the Cleanup Plan) would serve as the update to the Commonwealth's NPS Pollution Program Plan.

### ***Chesapeake Bay and Virginia Waters Clean-Up and Oversight Act of 2006 – HB1150***

The *Chesapeake Bay and Virginia Waters Clean-up and Oversight Act (HB1150)* was passed during the 2006 legislative session of the Virginia General Assembly (GA) and signed into law on April 3, 2006 (Title 62.1, Chapter 3.7, section 62.1-44.117-62.1-44.118). The Act established the requirement to develop a plan for the cleanup of the Chesapeake Bay and Virginia's waters designated as impaired by EPA. Subsequently the plan also addresses the protection of water resources not yet impaired by pollution. The resulting Cleanup Plan provides clear objectives, well-developed strategies, predictable time frames, realistic funding needs, common-sense mitigation strategies, and straightforward recommendations to the General Assembly for its consideration for stream restoration and protection. The initial plan was presented to the GA in 2007. The plan was last updated in June 2009. A progress report is produced annually as well. The latest status report was presented by the Secretary of Natural Resources of the Commonwealth of Virginia to members of the GA of Virginia in December 2012. It should be noted that this plan is very comprehensive in nature and addresses both point and nonpoint pollution sources, as well as air pollution. There are, however, very specific elements of the plan related to nonpoint source pollution. As noted the above section on the CWA Section 319 program, the relevant portions of Cleanup Plan are now considered Virginia's NPS Pollution Management Program Plan. EPA Region 3 NPS Program staff has reviewed the Cleanup Plan for its appropriateness to serve as Virginia's NPS Pollution Management Program Plan. Throughout this document the progress of this plan will be highlighted.

**Water Quality Monitoring, Information and Restoration Act of 1997**

In 1997, the Virginia General Assembly enacted the Water Quality Monitoring, Information, and Restoration Act (WQMIRA), §62.1-44.19:4 through 19:8 of the Code of Virginia. This statute directs the Department of Conservation and Recreation (DEQ) to develop a list of impaired waters, a Total Maximum Daily Load (TMDL) for each impairment, and implementation plans for these TMDLs. WQMIRA directs the Virginia Department of Environmental Quality (DEQ) to “develop and implement a plan to achieve fully supporting status for impaired waters.” In order for IPs to be approved by the Commonwealth, they must meet the requirements as outlined by WQMIRA.

**The Virginia Water Quality Improvement Act of 1997**

The *Virginia Water Quality Improvement Act (WQIA)* was passed during the 1997 legislative session of the Virginia GA and signed into law on March 20, 1997. This Act establishes a comprehensive statewide program to address point and non-point sources of water pollution. It creates the Virginia Water Quality Improvement Fund (WQIF) to provide assistance for water quality improvements to a broad array of entities, including local governments, soil and water conservation districts, and landowners. The fund was the principle source of state cost-share money for agricultural practices and to implement the nutrient and sediment reduction “Tributary Strategies” prepared pursuant to the Chesapeake 2000 Agreement and the *Code of Virginia*. The fund also provides grants for practices to control NPS pollution in “Southern Rivers” (SR); which are watersheds in Virginia that drain to waters other than the Chesapeake Bay. Technical and financial assistance are provided to local governments, soil and water conservation districts, and individuals through the Fund. In addition, provisions for water quality assessment and state and local cooperation are provided. DEQ is charged in assisting in the development of local cooperative NPS pollution programs and programs to implement Virginia’s nonpoint source pollution management program, in accordance with the WQIA, Section 10.1-2124.B of the *Code of Virginia*. The purpose of the cooperative nonpoint source pollution program is to maintain and/or restore water quality standards in stream segments where NPS pollution is a significant loading factor. NPS pollution programs require locally based remedies that address the unique, site-specific, and varied causes of NPS contaminants. Cooperative NPS pollution programs are combinations of programmatic tools, and technical and financial resources of varying emphasis used to target water quality impairments in a given watershed and political jurisdiction. A cooperative approach to protecting water quality helps local stakeholders develop their capabilities individually and collectively to address local water quality impairments. In 2009 the Virginia General Assembly created the Virginia Natural Resources Commitment Fund (VNRFCF) which is a sub-fund of WQIF specifically set-aside for agricultural cost-share program and practices.

**Summary of the 2013 Virginia NPS Pollution Management Program Annual Report**

The 2013 NPS Management Program Annual Report for Virginia is made up of two parts, which in their entirety make up the full report of accomplishments for the Commonwealth. The first part is the “Chesapeake Bay and Virginia Waters Clean-up Plan Progress Report” and the second part is the “TMDL Implementation Supplement”. As stated previously, Virginia has a NPS planning document called the Chesapeake Bay Virginia Waters Cleanup Plan that has progress reports and strategy updates submitted to the Virginia GA on an annual basis. The annual NPS report requirement will be fulfilled by the annual progress report for the Cleanup Plan. The second part of the NPS annual report is a supplement describing the progress made in TMDL implementation. Also, this report is a comprehensive summary of the activities accomplished by the Commonwealth in TMDL implementation plan development.

## 2013 NPS ANNUAL TMDL SUPPLEMENTAL REPORT:

### TMDL IMPLEMENTATION PROGRESS

#### CHAPTER 1: *TMDL Implementation Program Summary Report*

To meet the NPS annual reporting requirement for 2013 and to summarize the activities from July 1, 2012 through June 30, 2013 (FY13), DEQ has developed this ***TMDL Implementation Program Summary Report***. This report summarizes the accomplishments of the TMDL implementation program, focusing on Virginia's fiscal year 2013.

##### ***TMDL Implementation Program Background***

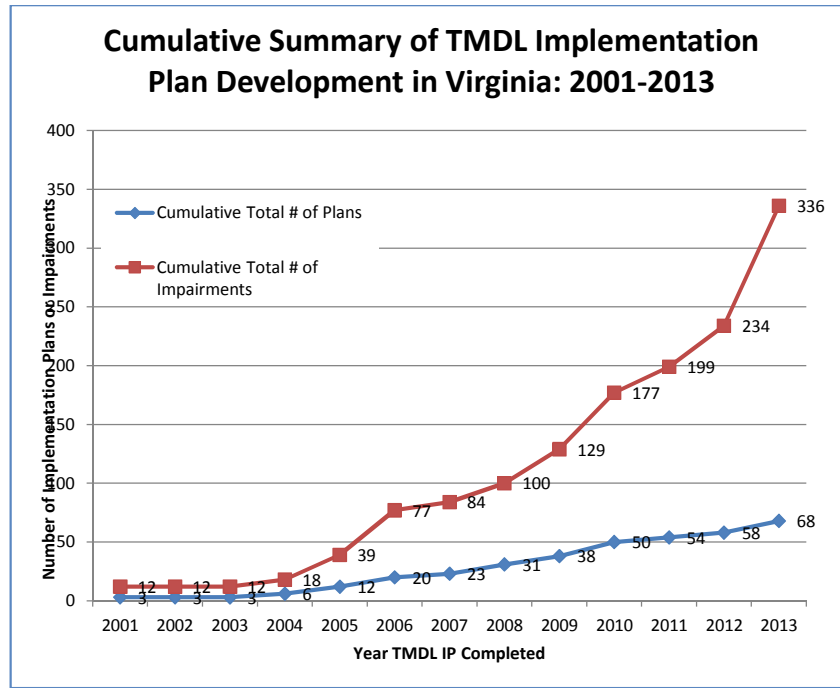
Virginia's goal is that all rivers, lakes, streams and tidal waters attain the appropriate beneficial uses. These beneficial uses are described by the following use goals: drinking water, primary contact/swimming, fishing, shellfishing, and aquatic life. These uses are protected by application of the state's numeric and narrative water quality standards. When the beneficial uses are not being met these waters are considered "impaired" and the state must take steps to meet water quality standards to ensure that water quality is restored. One very important step in restoring water quality in the impaired streams is the development of TMDLs.

The goal of TMDL program is to achieve attainment of water quality standards. The Commonwealth achieves this goal by means of a three-phase process: TMDL development, development of TMDL IPs and/or permit conditions, and implementation of permit conditions and/or best management practices. TMDL reports, implementation plans and implementation progress updates are available on the DEQ TMDL website at <http://www.deq.state.va.us/Programs/Water/WaterQualityInformationTMDLs/TMDL.aspx>.

##### ***TMDL Implementation Plans***

Virginia state law, WQMIRA, requires the development of a TMDL IP after a TMDL is developed and approved by EPA. The IP describes the measures and timeline to meet the TMDL, and includes estimated costs, and a monitoring plan. In FY2013, DCR, DEQ and other partners developed 10 IPs covering 102 impaired segments. In addition, 6 implementation plans covering 71 impairments (see Table I-1) were under development, but were not completed or approved by the end of the fiscal year. Since 2000, Virginia has completed 68 IPs, addressing 336 impairments.

Figures I-1 summarizes TMDL implementation plan development in Virginia since 2001. In the majority of cases, watersheds that have a completed implementation plan also have TMDL implementation projects underway. A summary of completed TMDL implementation plans is provided in Table I-1, while Figure I-2 shows the location of TMDL planning/implementation watersheds across the state.

**Figure I-1.** Cumulative summary of TMDL Implementation Plan development

**Table I-1. Completed TMDL Implementation Plans, January 2001- June 2013**

Watershed (# of impairments / # of impaired segments)	Location (county or city)	Impairment	Lead	Completion date
Middle Fork Holston (3/3)	Washington	Bc	DCR	2001
North River (Muddy, Lower Dry, Pleasant, and Mill Creek) (5/4)	Rockingham	Bc, Be	DCR	2001
Upper Blackwater River (4/4)	Franklin	Bc	DCR	2001
Catoctin Creek (4/4)	Loudoun	Bc	DCR	2004
Holmans Creek (2/2)	Shenandoah	Bc, Be	DCR	2004
Four Mile Run (1/1)	Arlington, Alexandria	Bc	DEQ	2004
Willis River (1/1)	Cumberland, Buckingham	Bc	DCR	2005
Chowan Study Area (9/9)	Multiple Counties	Bc	DEQ	2005
Moore's Creek (1/1)	Charlottesville, Albemarle	Bc	DEQ	2005
Guest River (5/5)	Wise, Scott, Dickenson	Be	DEQ	2005
Lower Blackwater, Maggoddee and Gills Creek (3/3)	Franklin	Bc	DCR	2005
Lynnhaven (shellfish) (2/2)	VA Beach	Bc	DEQ	2005
Cooks Creek and Blacks Run (6/2)	Rockingham, Harrisonburg	Bc, Be	DCR	2006
Thumb, Deep, Carter and Great Runs (4/4)	Fauquier, Stafford	Bc	DCR	2006
Big Otter (8/8)	Bedford, Campbell	Bc	DCR	2006
Mill and Dodd Creeks (2/2)	Floyd, Montgomery	Bc	DCR	2006
Little and Beaver Creek (3/2)	Bristol, Washington	Bc, Be	DCR	2006
Stroubles Creek (1/1)	Montgomery	Be	DEQ	2006
Back Creek (2/1)	Pulaski	Bc, Be	DEQ	2006/2007
Abrams and Opequon Creek (8/5)	Frederick, Winchester	Bc, Be	DEQ	2006
Knox and PawPaw Creek (4/2)	Buchanan	Bc, Be	DEQ	2007
Hawksbill and Mill Creek (2/2)	Page	Bc	DCR	2007
Looney Creek (1/1)	Botetourt	Bc	DCR	2007
Upper Clinch River (1/1)	Tazewell	Be	DCR	2008
Occahannock Creek (shellfish) (1/1)	Accomac	Bc	DCR	2008
Falling River (1/1)	Campbell, Appomattox	Bc	DCR	2008
Dumps Creek (2/1)	Russell	TSS, TDS	DEQ	2008
Bluestone River (1/2)	Tazewell, Bluefield	Bc, Be (sed)	DCR	2008
Smith Creek (1/2)	Rockingham, Shenandoah	Bc, Be (sed)	DEQ	2008
Appomattox River – Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek (5/5)	Prince Edward, Amelia	Bc	DCR	2008
Appomattox River – Flat, Nibbs, Deep and West Creeks (4/4)	Amelia, Nottoway	Bc	DCR	2008
Straight Creek, Stone Creek and Tributaries (3/3)	Lee	Bc, Be (sed)	DEQ	2009
Long Glade Run, Mossy Creek and Naked Creek (5/3)	Augusta, Rockingham	Bc, Be (sed)	DCR	2009
Back Bay Watershed (1/1)	City of Virginia Beach	Bc	DEQ	2009
North Landing Watershed (4/4)	City of Virginia Beach	Bc	DEQ	2009
Pigg River and Old Womans Creek (8/8)	Franklin, Pittsylvania	Bc	DEQ	2009
Cub, Turnip, Buffalo and UT Buffalo Creeks (4/4)	Appomattox, Charlotte	Bc	DCR	2009
Hazel River Watershed (4/4)	Culpeper, Madison, Rappahannock	Bc	DCR	2009
Greenvale Creek, Paynes Creek and Beach Creek (shellfish)(3/2)	Lancaster	Bc	DCR	2010
Ash Camp and Twitty's Creek (2/2)	Charlotte	Be (sed)	DCR	2010
Upper & Lower Middle River, Moffett Creek & Polecat Draft (7/5)	Augusta	Bc, Be (sed)	DCR	2010
Mill and Powhatan Creek (2/2)	James City County	Bc	DEQ	2010
Lewis Creek (1/1)	Russell	Be (sed)	DCR	2010
Browns, Craig and Marsh Runs (3/3)	Fauquier	Bc	DCR	2010
Little Dark Run and Robinson River (3/3)	Culpeper & Madison	Bc	DCR	2010
Rock Island, Austin, Frisby, Troublesome Creeks, North and Slate Rivers (6/6)	Buckingham	Bc	DCR	2010
Hays, Moffatts, Otts and Walker Creeks (4/4)	Augusta & Rockbridge	Bc	DCR	2010
Christians Creek and South River (6/3)	Augusta & Waynesboro	Bc, Be (sed)	DCR	2010
South James River, Ivy, Tomahawk, Burton, Judith, Fishing,	Campbell, Bedford,	Bc	DEQ	2010



Blackwater and Beaver Creeks (8/8)	Amherst, Lynchburg			
Nansemond River, Shingle Creek (3/3)	Suffolk	Bc	DEQ	2010
Cherrystone Inlet, Kings Creek (shellfish) (1/1)	Northampton	Bc	DCR	2011
Roanoke River Watersheds – Upper Banister River and Stinking River, Bearskin, Cherrystone and Whitethorn Creeks (5/5)	Pittsylvania	Bc	DCR	2011
York Basin Watersheds – Beaver Creek, Goldmine Creek, Mountain Run, Pamunkey Creek, Plentiful Creek, Terry's Run (6/6)	Louisa, Orange, Spotsylvania	Bc	DCR	2011
James River Watersheds- James River and Bernards, Powhite Reedy, Gilles, Almond, Goode, Falling and Noname Creeks (10/10)	Chesterfield, Powhatan, Henrico, Richmond	Bc	DEQ	2011
Little River Watershed – Little River, Meadow Run, Pine, West Fork Dodd, Dodd, Meadow, Brush, Laurel, Big Indian Creeks (26/26)	Montgomery & Floyd	Bc, Be (sed), Temp	DEQ	2012
Clinch River; Coal, Middle, and Plum Creeks (7/7)	Tazewell	Bc, Be (sed)	DEQ	2012
Hoffler Creek (1/1)	Suffolk & Portsmouth	Bc	DEQ	2012
Mill Creek (1/1)	Northampton	Be (DO, pH)	DEQ	2012
Lower Banister River, Polecat Creek and Sandy Creek (3/3)	Halifax, Pittsylvania	BC	DCR	2013
Middle Fork Holston River & Wolf Creek (8/6)	Abingdon, Smyth, Washington, Wythe	Bc, Be (sed)	DCR	2013
Spout Run (4/3)	Clarke	Bc, Be (sed)	DCR	2013
Piankatank River, Milford Haven, Gwynns Island (17/16)	Mathews, Middlesex, Gloucester	Bc	DCR	2013
Mill Creek, Cove Creek, Miller Creek, Stony Fork, Tate Run, S.F. Reed Creek, Reed Creek (9/9)	Wythe	Bc	DEQ	2013
Beaverdam, Boatswain Creek, Chickahominy River, Collins Run, Stony Run (5/5)	Hanover, Henrico, Charles City, Richmond	Bc	DEQ	2013
Rockfish River (4/4)	Nelson	Bc, Be (sed)	DEQ	2013
South Fork Mayo River, North Fork Mayo River, Blackberry Creek, Smith Creek, Marrowbone Creek, Leatherwood Creek (8/8)	Henry, Patrick, and City of Martinsville	Bc	DEQ	2013
Darden Mill Run, Mill Swamp, Three Creek (9)	Brunswick, Greensville & Southampton	Bc	DEQ	2013
North Fork Holston River (35/35)	Scott, Washington, Smyth, Russell, Bland, Tazewell	BC, Temp	DEQ	2013
Turley Creek, Long Meadow (2/2)	Rockingham	Be (sed)	DEQ	Not approved
Moore's Creek, Lodge Creek, Meadows Creek and Schenks Branch (4/4)	Albemarle and Charlottesville	Be (sed)	DEQ	Not Approved
Linville Creek (2/1)	Rockingham, Broadway	Bc, Be (sed)	DCR	UD
Wards Creek, Upper Chippokes Creek, Western Run, Crewes Channel, West Run, James River (6/6)	Charles City, Henrico & Hanover	Bc	DEQ	UD
Elk and Cripple Creek (2)	Grayson & Wythe	Bc	DEQ	UD
Roanoke River Watersheds – South Fork, Smith Creek, Bradshaw, North Fork, Wilson Creek, Mud Lick Creek, Mason Creek, Murray Run, Ore Branch, Perters Creek, Roanoke River, Carvin Creek, Glade Creek, Laymantown Creek, Tinker Creek, Back Creek (55)	Botetourt, Montgomery, Roanoke, Roanoke City, Salem, Town of Vinton	Bc, Be (sed)	DEQ	UD
Total IPs Completed: 68 Plans, 336 Impairments; Total IP complete but not approved, 2; Total IPs Under Development (UD): 4 IPs, 63 impairments. Impairment types: Bc = bacteria, Bn = Benthic, TSS = Total suspended solids, TDS = Total dissolved solids, Sed = sediment				

#### Watershed Restoration and TMDL Implementation

The goal of the TMDL Implementation Program is to implement targeted, on-the-ground activities, identified in TMDL IPs, which will result in water quality improvements and subsequent delisting of impaired streams. Virginia uses a staged approach that provides opportunities for periodic evaluation of the effectiveness of the implementation actions and adjustment of efforts to achieve water quality objectives in a timely and cost-effective manner.

From January 1, 2012 thru June 30, 2013 there were 29 implementation projects supported by Federal EPA §319(h) funding, state WQIF and/or state Virginia Natural Resources Conservation Fund (VNRFCF). Collectively these projects spent \$1,982,781 of cost-share funds implementing 538 agricultural and residential BMPs. This included 325 BMPs funded with 319(h) and 213 BMPs funded thru VNRFCF or WQIF. This implementation resulted in over 230,997 feet of stream exclusion, and the reduction of 1.295+16 colony forming units (CFU) of fecal coliform bacteria, 52,722 pounds of nitrogen, 8,726 pounds of phosphorous, and 8,606 tons of sediment..

**Federal §319(h) Projects:** DCR's first TMDL implementation projects, also known as "pilot projects" were funded through federal section 319 beginning in 2001 with the Upper Blackwater River, Middle Fork Holston River, and North River. The first two projects ended in 2007 while the North River finished in August 2008. Since initiation of these pilot projects, DCR has initiated a total of 21 additional TMDL implementation projects across the state (Table I-2) with 319(h) funding. In addition, as of June 2013 DCR has completed and closed implementation for eight projects. Since July 2013 implementation was started in 5 project areas (Lewis Creek, Guest River, Upper York River Watershed, Knox and PawPaw, and Hays, Moffats, Otts and Walker Creeks).

These projects are primarily funded with Section 319 federal funds; however, several projects have also received non-federal money to fund urban and/or septic BMP installation (Hazel River, Big Otter River, Cooks Creek and Blacks Run, Little and Beaver Creek, etc.). In addition DCR was successful in securing over \$5.5 million of state VNRFCF to augment federal 319 funds for agricultural BMPs. In 2013 a total of 11 projects were implemented using Federal 319 funds; of these projects eight (Big Otter, Thumb/Deep/Carter/Great Runs, Lower Blackwater River, Upper Hazel River, Craig/Brown/Marsh Runs, Moores Creek, Lewis Creek, Guest River, Knox and PawPaw Creeks, Upper York River, and Hays/Moffatts/Otts/Walker Creeks) received state WQIF money to fund agricultural practices. It is hoped that Virginia will eventually fund all agricultural practices for TMDL implementation projects using non-319 sources (state cost-share, Natural Resources Conservation Service (NRCS), private funds, etc.), while section 319 will fund mining, residential septic, urban/residential stormwater, and pet waste practices identified in TMDL implementation plans.

**State funded WQIF Targeted TMDL Projects:** In 2006 DCR started implementation projects for 46 impaired segments utilizing state funding through the WQIF. These projects were the start of the state focusing funding to implement TMDLs. Currently these projects receive funding for agricultural practices through the state cost-share program, while several project sponsors have pursued competitive grant funds to implement urban and septic management practices. DCR hopes that eventually it will be able to identify and secure consistent funding for all aspects of the TMDL implementation plans for these project areas. Implementation on most of these projects will continue through the end of FY 2014.

#### ***Virginia's TMDL Implementation Program in 2013***

As of June 2013, Virginia's TMDL Implementation Program includes 16 implementation projects currently or previously funded with Federal 319(h) funds as well as some state funds (Table I-2, sections A and B), 2 projects that received one time allotments of a variety of federal, state, local and non-profit sources (Table I-2, section C) and 14 projects (section D) receiving state funds for agricultural implementation.

**Table I-2. Summary of Virginia TMDL Implementation, January 2001-June 2013**

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
<b>A. Eight projects received 5-7 years of continuous funding from 319(h) administered by DCR. These projects are no longer receiving TMDL funds, but may continue to receive funding from other sources.</b>				
Middle Fork Holston River	VAS-O05R	Success Story 2005, 2013	2001-2008	\$319(h)
Upper Blackwater	LAW-L08R	Some improvement	2001-2007	\$319(h)
North River	VAN-B21R, B22R, B27R, B29R	Improvement, Muddy Creek delisted for nitrate-N 2010	2001-2008	\$319(h)
Holmans Creek	VAV-B45R	Some improvement	2005-2008	\$319(h)
Catoctin Creek	VAN-A-02R	Some improvement	2005-2009	\$319(h)
Cooks Creek and Blacks Run	VAV-B25R, B26R	Some improvement	2006-2012	\$319 RFP, NFWF
Mill and Dodd Creeks	VAW-N20R, N21R	None reported	2007-2011	\$319 & VNRCF
Little and Beaver Creeks	VAS-O07	None reported	2007-2012	\$319, VNRCF, RFP

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
<b>B. Sixteen projects funded by Federal 319(h) as well as State WQIF and VNRCF administered by DCR between July 2012 and June 2013</b>				
Big Otter River	VAW-L23R, L25R, L27R, L28R	segment delisted 2008	2006-2012	\$319, VNRCF, RFP
Willis River	VAC-H36R	delisted (3), Success Story 2010	2005-2013	\$319(h), VNRCF
Thumb, Great, Carter and Deep Runs	VAN-E01R, E02R & E10R	Some improvement, Carter Run Success Story 2013, possible delisting	2006-2013	\$319(h), VNRCF
Hawksbill and Mill Creeks	VAN-B38R, B39R	None reported	2008-2012	\$319(h), VNRCF
Looney Creek	VAW-I26R	None reported	2009-2013	\$319, VNRCF
Hazel River	VAN-E03R, E04R, E05R	None reported	2009-2013	\$319, VNRCF, WQIF RFP
Slate River and Rock Island Creek	VAC-H1/R, H21R, H22R	Too Early	2010-2014	\$319, VNRCF
Craig Run, Browns Run and Marsh Run	VAN-E08R	Too Early	2012-2014,	\$319(h), VNRCF, VNCR-CBLEI
Moores Creek	VAV-H28R	Some improvement	2012-2014	\$319, VNRCF, WQIF RFP
Smith Creek	VAV-1347R	Too Early	2012-2014, 2008+ for NRCS	\$319(h), NRCS
Guest River	VAS-P11R	None reported	2012-2014	\$319, VNRCF, WQIF RFP
Lewis Creek	VAS-P04R	Too Early	2012-2014	\$319(h), VNRCF
Upper York River	VAN-F06R, F07R	Too Early	2012-2014	\$319(h), VNRCF
Hays, Moffats, Otts, and Walker Creeks	VAN-I34R	Too Early	2012-2014	\$319(h), VNRCF
Knox and Pawpaw Creek	VAS-Q03R	Too Early	2012-2014	\$319(h), VNRCF

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
<b>C. Two projects receiving minimal, one time funding through DCR (RFPs etc)</b>				
Stroubles Creek	VAW-N22R	Some Improvement	2006+	WQIF RFP
Little Dark Run and Robinson River	VAN-E15R	Too early	2011	WQIF RFP, CBLEI-TMDL (WQIF)

Watershed Area	TMDL Segment	Status	Years of Implementation	Funds Used
<b>D. Fourteen projects funded by WQIF/VNRCF funds for agricultural BMPs (and RFP for septic work)</b>				
Nottoway	VASC-K14R	N/A	2005-2009	WQIF, VNRCF
Falling River	VAW-L34R	Some improvement	2007 - 2014)	WQIF, VNRCF
Mossy and Naked Creeks, Long Glade Run	VAV-B19R, B24R, B28R	Some improvement	2007 - 2014	WQIF, VNRCF
Pigg River (Blue Ridge SWCD)	VAW-L14R, L15R, L16R, L17R	Improvement	2007 - 2014	WQIF, VNRCF, RFP
Pigg River (Pittsylvania SWCD)	VAW-L13R, L17R, L18R	Some improvement	2007 - 2013	WQIF, VNRCF, RFP
Twittys and Ash Camp Creeks	VAC-L39R	Inadequate data	2007 - 2012	WQIF, VNRCF
Abrams and Opequon Creeks	VAV-B08R, B09R	N/A	2006 - 2011	WQIF, VNRCF
Cub, Turnip and Buffalo Creeks	VAC-L36R, L37R, L40R	No data	2007 - 2012	WQIF, VNRCF
Flat, Nibbs, Deep and West Creeks	VAP-J08R, L09R, J11R	Improvement, Flat Creek identified for Success Story	2007 - 2014	WQIF, VNRCF
Moffett Creek, Middle River, Polecat Draft	VAV-B10, B13, B15	Some improvement	2007 - 2014	WQIF, VNRCF
Christians Creek and South River	VAV-B14, B30	Improvement	2007 - 2014	WQIF, VNRCF
Upper Clinch River	VAS-P01R	Inadequate data	2007 - 2012	WQIF, VNRCF
Bluestone River	VAS-N36R	Some improvement	2007 - 2012	WQIF, VNRCF
Briery, Little Sandy, Spring, Saylers Creeks and Bush River	VAC-J02, J03, J04, J05 AND J06R	Some improvement	2007 - 2014	WQIF, VNRCF

### ***Funding of Implementation***

As the agency taking the lead in nonpoint TMDL watershed implementation prior to July 1, 2013, DCR utilized both state funds and §319(h) funds to pay for DCR regional staff to provide project management and technical support to watershed stakeholders to implement these projects. As a match to Federal 319(h) funds, Virginia provided state funds for operational support of the 47 Soil and Water Conservation Districts, which provide technical assistance with the design and installation of agricultural BMPs. In addition, Virginia runs a comprehensive cost-share program for BMP implementation utilizing both federal 319(h) grant funding, other grant funding and state resources from the Water Quality Improvement Fund and the Virginia Natural Resources Commitment Fund. A summary of targeted TMDL cost share funds spent in FY2013 is provided in Tables I-3 and I-4.

**Table I-3.** Summary of targeted TMDL cost-share funds spent on TMDL implementation: July 2012 – June 2013

Funding Source	Cost-share paid
<b>Federal 319(h)</b>	\$ 424,260
<b>State VNRCF</b>	\$ 1,460,337
<b>State WQIF</b>	\$ 98,184
<b>TOTAL</b>	<b>\$1,982,781</b>

**Table I-4.** Summary of cost-share funds spent on implementation by TMDL watershed: July 2012 – June 2013

<b>TMDL Implementation Project</b>	<b># of BMPs</b>	<b>Cost-share Funding</b>	<b>\$ Match</b>
Big Otter River Watershed	21	\$ 235,512	\$ 195,496
Carter Run, Great Run, Deep Run and Thumb Run	77	\$ 270,084	\$ 165,526
Christians Creek and South River Watersheds	5	\$ 22,534	\$ 6,699
Craig Run, Marsh Run and Browns Run	16	\$ 119,871	\$ 127,500
Cub Creek, Turnip Creek, Buffalo Creek and UT to Buffalo Creek	2	\$ 46,755	\$ 11,699
Falling River	11	\$ 207,076	\$ 87,956
Flat, Nibbs, Deep and West Creeks	12	\$ 177,349	\$ 57,853
Hawksbill Creek and Mill Creek	106	\$ 58,110	\$ 45,917
Hays and Moffatts Creeks	3	\$ 36,612	\$ 11,018
Slate River Watershed	11	\$ 46,635	\$ 19,672
Looney Creek	13	\$ 123,048	\$ 125,366
Lower Banister River Watershed	1	\$ 33,635	\$ 7,470
Lower Blackwater River, Maggodee and Gills Creek	1	\$ 14,446	\$ 2,570
Moffett Creek, Middle River and Polecat Draft	4	\$ 48,645	\$ 4,805
Mossy Creek, Naked Creek and Long Glade Run	2	\$ 6,897	\$ 5,191
North and South Mayo River and Smith River Watersheds	2	\$ 45,844	\$ 17,607
Pigg River and Old Womans Creek Watersheds	22	\$ 76,555	\$ 53,232
Robinson River, Little Dark Run	114	\$ 52,061	\$ 57,753
Smith Creek Watershed	33	\$ 5,824	\$ 6,099
Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek	4	\$ 25,085	\$ 80,571
Upper Banister River Watershed	1	\$ 12,393	\$ 2,187
Upper Clinch River	1	\$ 8,908	\$ 1,572
Upper Hazel River	49	\$ 142,500	\$ 170,101
Upper York River Basin	16	\$ 114,395	\$ 36,289
Willis River Watershed	15	\$ 52,006	\$ 18,884
<b>TOTAL</b>	<b>538</b>	<b>\$1,982,781</b>	<b>\$ 1,319,033</b>

Note: in previous version of this report Moffett Creek, Middle River and Polecat Draft were left off the summary. This has been corrected and the information updated.

**BMP Implementation and Pollution Reductions**

Tracking both BMP implementation and water quality improvements in TMDL watersheds is critical in measuring success within the TMDL program. BMPs are effective and practical ways to prevent or reduce pollution from nonpoint sources to ensure water quality. While DCR has a highly effective BMP tracking program in place to account for BMPs installed using state or federal cost share funds, tracking BMPs installed voluntarily (without government assistance) has proven challenging. DCR is currently developing a mechanism by which voluntary practices can be accounted for; however, BMP implementation and associated pollutant reductions reported to date are largely practices installed with government cost share funds. Table I-5 provides a summary of BMPs installed in targeted TMDL project areas in FY2013, Table I-6 shows associated pollutant reductions by BMP funding source, and Table I-7 breaks down BMP implementation and pollution reductions by TMDL watershed. An additional break down of BMP implementation by project area can be found in Chapter 2 for specific TMDL Implementation projects.

From January 1, 2012 thru June 30, 2013 there were 29 implementation projects supported by federal EPA §319(h) funding and/or state funding. Collectively these projects spent \$1,98,781 of cost-share funds implementing 538 agricultural and residential BMPs. This included 325 BMPs funded with 319(h) and 213BMPs funded thru state VNRFCF or WQIF in TMDL areas. This implementation resulted in over 230,997 feet of stream exclusion, and the reduction of 1.295+16 colony forming units (CFU) of fecal coliform bacteria, 52,722 pounds of nitrogen, 8,726 pounds of phosphorous, and 8,606 tons of sediment.

**Table I-5.** Summary of BMP Implementation for TMDL Projects from 7/1/12-6/30/13

Practice	Practice Description	Units	BMP Extent	# of BMP
FR-1	Reforestation of crop and pastureland	Acres	30	1
FR-3	Woodland buffer filter	Acres	2	2
LE-1T	Livestock exclusion with riparian buffers for TMDL implementation	Linear feet	173,243	53
LE-2T	Livestock exclusion with reduced setback for TMDL implementation	Linear feet	17,613	6
RB-1	Septic tank pumpout	System	307	307
RB-2	Connection to public sewer	System	1	1
RB-3	Septic system repair	System	79	79
RB-4	Septic system replacement	System	46	46
RB-4P	Septic system installation/replacement with pump	System	10	10
RB-5	Alternative waste treatment system	System	6	6
SL-1	Permanent vegetative cover on cropland	Acres	29	4
SL-10T	Pasture Management	Acres	387	3
SL-6AT	Small Acreage Grazing System (TMDL)	Acres	200	1
SL-6T	Stream exclusion with grazing land management for TMDL implementation	Linear feet	21,916	10
SL-7T	Support for extension of CREP watering systems for TMDL implementation	Acres	87	3
WP-2T	Stream protection for TMDL implementation	Linear feet	18,225	4
WP-4B	Loafing lot management system	System	1	1
			<b>TOTAL</b>	<b>538</b>

Note: in previous version of this report Moffett Creek, Middle River and Polecat Draft were left off the summary. This has been corrected and the information updated.

**Table I-6.** Summary of Pollutants Reduced from 7/1/2012 - 6/30/2013 through TMDL Implementation

Data	Federal 319(h)	State VNRCF	State WQIF	Grand Total
Number of BMPs Installed	325	80	133	538
Total Pounds Nitrogen Reduced	10787	40,832	1104	52,722
Total Pounds Phosphorus	1195	7,532	0	8,726
Total Tons Sediment Reduced	1423	7.183	0	8,606
Total of Bacteria Reduced	1.03E+15	1.19E+16	1.83E+12	1.27E 16

**Table I-7.** Summary of BMPs Installed and Pollution Reductions by TMDL Watershed from July 2012 - June 2013

TMDL Implementation Project	# of BMPs	Pounds Nitrogen	Pounds Phosphorous	Pounds Sediment	Bacterial (CFU)
Big Otter River Watershed	21	3,480	637	24	1.022E+15
Carter Run, Great Run, Deep Run and Thumb Run	77	13,794	1,927	82	1.541E+15
Christians Creek and South River Watersheds	5	1,048	208	5	3.963E+14
Craig Run, Marsh Run and Browns Run	16	4,893	706	18	9.404E+14
Cub Creek, Turnip Creek, Buffalo Creek and UT to Buffalo Creek	2	405	60	2	3.806E+14
Falling River	11	1,925	330	12	8.678E+14
Flat, Nibbs, Deep and West Creeks	12	5,752	1,580	13	2.022E+15
Hawksbill Creek and Mill Creek	106	1,160	79	106	1.190E+14
Hays and Moffatts Creeks	3	1,295	252	4	2.674E+14
James River (Slate River) Watershed	11	1,436	173	11	7.667E+13
Looney Creek	13	5,085	769	14	4.866E+14
Lower Banister River Watershed	1	1,842	416	1	7.353E+13
Lower Blackwater River, Maggodee and Gills Creek	1	101	20	1	2.018E+14
Moffett Creek, Middle River and Polecat Draft	4	3,812	757	701	2.94E+14
Mossy Creek, Naked Creek and Long Glade Run	2	343	68	2	3.460E+13
North and South Mayo River and Smith River Watersheds	2	855	157	2	2.336E+14
Pigg River and Old Womans Creek Watersheds	22	792	69	22	9.147E+13
Robinson River, Little Dark Run	114	665	-	114	1.117E+12
Smith Creek Watershed	33	174	-	33	2.936E+11
Spring Creek, Briery Creek, Bush River, Little Sandy River and Saylers Creek	4	418	82	4	1.034E+15
Upper Banister River Watershed	1	72	14	1	8.823E+13
Upper Clinch River	1	444	82	1	5.198E+13
Upper Hazel River	49	1,656	204	51	2.416E+15
Upper York River Basin	16	586	50	16	2.208E+14
Willis River Watershed	15	693	85	15	8.852E+13
<b>TOTAL</b>	<b>538</b>	<b>52,722</b>	<b>8,726</b>	<b>8,606</b>	<b>1.295E+16</b>

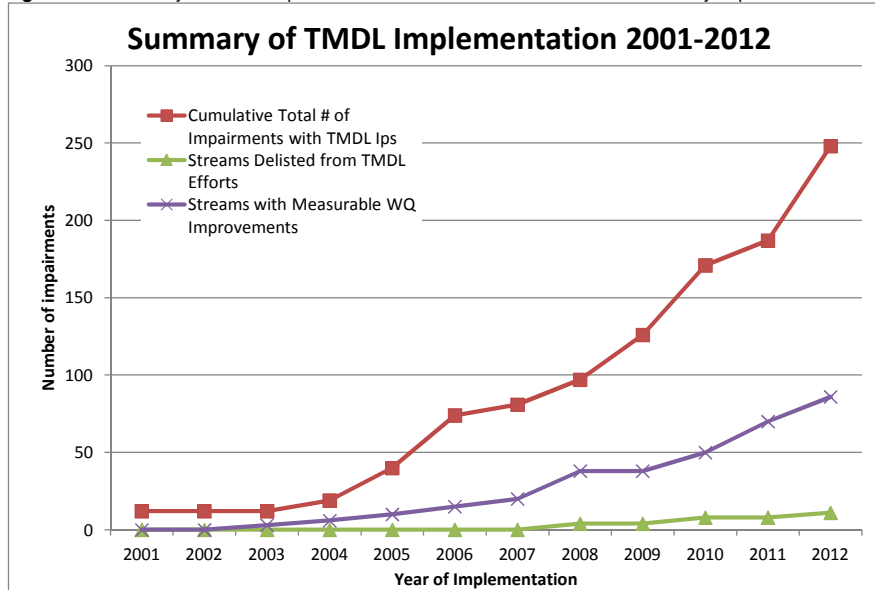
Note: Although Virginia provided TMDL Implementation funding for 29 project areas in 2013, only 24 projects reported BMPs installed. Note: in previous version of this report Moffett Creek, Middle River and Polecat Draft were left off the summary. This has been corrected and the information updated.

**Water Quality Improvements, Watershed Restoration, Delisting and Future Actions**

Translating TMDLs developed at an ambitious pace into actual water quality improvements is a growing challenge in the TMDL program. Virginia has been implementing TMDLs using existing nonpoint source programs and funding sources despite inadequacies in staffing and funding to handle the volume of TMDLs. Existing resources include regulatory permitting programs from DEQ, DCR and DMME that limit discharges to state waters. These programs are utilized when stream impairments are attributed to a permitted facility. For non-permitted activities, Virginia's approach has been to use incentive-based programs such as the Virginia Agricultural Cost Share Program and Section 319 grant funds. Virginia also offers grant funding for the implementation of BMPs and for technical assistance funding in watersheds with approved implementation plans.

Despite the challenges in attaining water quality standards, Virginia's TMDL program has shown that properly applied and maintained best management practices can result in measurable improvements in water quality (Table I-11). Virginia's natural resource agencies will continue to engage and work with watershed communities to restore their local rivers and streams using existing programs and resources, and exploring innovative ideas and funding strategies for the future.

**Figure I-2. Summary of TMDL Implementation versus Measurement of Water Quality Improvement**





## CHAPTER 2: *Progress Reports for TMDL Implementation Projects*

This chapter provides annual and comprehensive summaries of the following TMDL implementation projects:

**Federal Section 319(h) TMDL Implementation Projects – Current Projects:** These projects address agricultural, residential septic, urban BMP activities. These projects are funded mainly with Federal 319(h) but some projects have received supplemental state funding from either the Water Quality Improvement Fund or the Virginia Natural Resources Commitment Fund

- 1) Big Otter River Project: July 2006 – March 2013
- 2) Upper Hazel River Project: July 2009 - June 2013
- 3) Looney Creek Project: July 2009 - June 2013
- 4) Mill and Hawksbill Creeks Project: January 2008 - June 2013
- 5) Thumb, Deep, Carter and Great Runs Project: July 2006 - June 2013
- 6) Willis River Project: July 2005 - June 2013
- 7) Slate River Project: July 2011 - June 2013
- 8) Moores Creek Project: January 2012 - June 2013
- 9) Smith Creek Project: January 2012 - June 2013
- 10) Craig, Brown and Marsh Runs Project: January 2012 - June 2013
- 11) Hays Creek Project: October 2012-June 2013
- 12) Upper York River Project: October 2012-June 2013

**Other Implementation Projects:** These projects have no 319(h) funding, they are implementing a TMDL IP with different sources of state funds, but also have received WQIF Targeted TMDL funding.

- 1) Robinson River and Little Dark Run TMDL Implementation Project

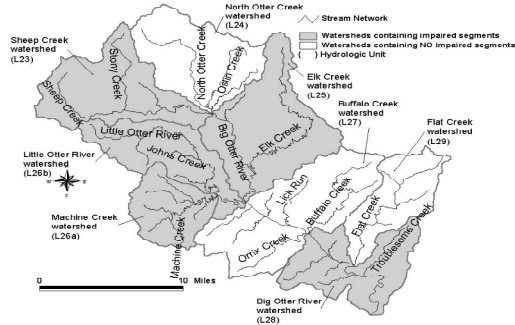
**WQIF Targeted TMDL Implementation Projects:** These projects are exclusively funded by State WQIF resources to address agricultural BMPs. All projects started around July 2006 and were still active through June 2013.

- 1) Christians Creek and South River TMDL Implementation Project
- 2) Moffett Creek, Middle River and Polecat Draft TMDL Implementation Project
- 3) Mossy Creek, Long Glade Run and Naked Creek TMDL Implementation Project
- 4) Falling River TMDL Implementation Project
- 5) Pigg River TMDL Implementation Project (Blue Ridge SWCD)
- 6) Pigg River TMDL Implementation Project (Pittsylvania SWCD)
- 7) Flat, Nibbs, Deep and West Creeks TMDL Implementation Project
- 8) Spring, Briery and Saylers Creeks, Little Sandy and Bush Rivers TMDL Implementation Project
- 9) Cub Creek TMDL Implementation Project (Appomattox County portion only)
- 10) Southern Rivers Livestock Exclusion TMDL Implementation Project (Halifax, Pittsylvania and Patrick SWCDs)

## Current 319H Project Report - Big Otter River TMDL Implementation Project: July 2006 – June 2013

### Project Location

The Big Otter River Basin (BOR) is located in Bedford and Campbell Counties, Virginia, and includes the City of Bedford and the suburbs of the City of Lynchburg. There are 267 miles of stream in the 388 mi<sup>2</sup> basin. The Big Otter River is a tributary of the Roanoke River, which empties into Buggs Island Lake, Lake Gaston and eventually the Albemarle Sound in North Carolina. The Big Otter River was placed on Virginia's 303(d) list of impaired waters in 1998 for violating the water quality standard for fecal coliform bacteria. DEQ completed a TMDL for the watershed in 2000. Eight subwatersheds are included in the project area: Sheep Creek, Elk Creek, Machine Creek, Little Otter River, Lower Big Otter River, North Otter Creek, Buffalo Creek (Falling & Elk Creeks), and Flat Creek. The latter 3 watersheds contain no impairments, but are included because they drain directly to the project area and contribute to the pollution load.



**Big Otter River BMP Summary: July 2006-June 2013**

Control Measure*	Unit	Total	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	Feet	934,560	412,504	44
Riparian Buffer Established	Acre		104	
Livestock Exclusion System	System	270	144	53
Forest Buffer	Acre		148	
Animal Waste Control			2	
Pasture Management	Acre	7,001		
<b>Residential</b>				
Septic Pump Out	System		25	
Connection to Sewer	System		6	
Septic System Repair	System	34	28	82
Septic System Installation	System	187	86	46
Alternative Waste Treatment System	System	26	6	23
*NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously)				
<b>Water Quality Goals Met</b>	<b>Unit</b>	<b>Miles Listed</b>	<b>Miles Delisted</b>	<b>%</b>
Stream impairment on the 303(d) list	Miles	76.78	-	-

### Implementation Highlights

Since the July 2006, the Peaks of Otter Soil & Water Conservation District has administered the Big Otter River TMDL Implementation Project. From July 1, 2012 through June 30, 2013 a total of 24 BMPs were installed as part of this effort, which are included in the total column in the table on the right. A total of ten agricultural BMPs were installed during this period including 37,856 feet of stream exclusion fencing. In addition, 14 residential BMPs were completed.

Since July 2006, 160 agricultural BMPs have been installed including 144 stream exclusion systems resulting in over 78 miles of stream exclusion fencing. In addition, 150 residential BMPs have been installed including 25 septic tank pumpouts, 28 septic system repairs, six connections to public sewer, 78 septic system replacements/installations, and six alternative waste treatment systems. The pollution reductions as a result of the BMPs installed included below are only for 319(h) funded practices.

**Pollution Reductions for the Big Otter River: July 2006-June 2013**

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2006-June 2012	1.96E+16	20,136	4,002	6,318
July 2012-June 2013	1.02E+15	3,480	637	24
<b>TOTAL</b>	<b>2.06E+16</b>	<b>23,616</b>	<b>4,639</b>	<b>6,342</b>

## Current 319H Project Report - Upper Hazel River TMDL Implementation

### Project: July 2009 – June 2013

#### Project Location

The Hazel River watershed covers approximately 135,610 acres and includes, along with the Hazel River, the Hughes, Rush, and Thornton Rivers. The Hazel River begins in Rappahannock County, Virginia south of Panorama and continues downstream to its confluence with Rappahannock River northwest of Remington, Virginia. The Rappahannock River forms in Fauquier County, Virginia southeast of Front Royal and continues downstream to the Chesapeake Bay. The Hazel River and its tributaries were placed on Virginia's 303(d) list of impaired waters for violations of the fecal coliform bacteria standard between 2002 and 2004. A TMDL was developed to address these impairments in 2007.



#### Implementation Highlights

A TMDL implementation plan was developed for the Hazel River in May 2009. The Culpeper Soil and Water Conservation District (CSWCD) began administering the residential and agricultural BMP programs in July 2009. The table on the right shows BMPs implemented in the project area since it began and cumulative implementation goals established in the plan.

From July 2012 thru June 2013 the CSWCD installed six agricultural BMPs. This included five livestock stream exclusion practices that fenced out over 20,596 feet of stream and 1.3 acres of woodland buffer filter area. In the residential program 43 BMPs were installed between July 2012 and June 2013. This included 27 septic system pump outs, ten septic system repairs, five septic system replacements, and one alternate on-site system.

Pollution reductions resulting from BMP installations since 2009 are summarized in the table below.

Hazel River BMP Summary: July 2009 – June 2013

Control Measure*	Units**	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	2,307,360	160,216	7
Stream Exclusion Fencing	S	1,072	60	6
Riparian Buffer	Ac	-----	102	-----
Manure Incorporation	Ac	569	-----	0
Pasture Management	Ac	53,621	-----	0
Woodland buffer filter	Ac	-----	3.8	-----
Reforestation of erodible crop and pasture land	Ac	283	-----	0
Permanent vegetative cover on cropland	Ac	-----	22	-----
Veg. buffer on cropland	Ac	283	185	65
<b>Residential</b>				
CCU Treatment*	S	20	-----	0
Pet waste Composters	S	4,211	-----	0
<b>Residential Septic</b>				
Septic Tank Pump Out	S	-----	118	-----
Septic System Repair	S	443	47	11
Septic System Installation	S	673	35	5
Alternative Waste Treatment	S	230	2	<1

\*NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously) \*Ac = Acres, S = System, F = Feet, CCU = Confined Canine Unit

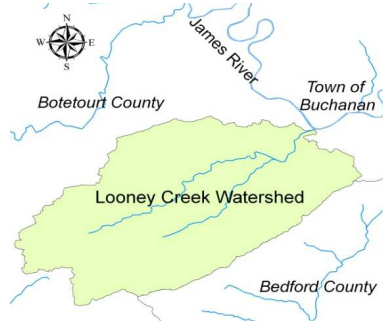
Pollution Reductions for Hazel River: July 2009-June 2013

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2012 – June 2013	2.42E+15	1,656	204	51
July 2009-June 2012	7.33E+15	4,657	514	623

## Current 319H Project Report - Looney Creek TMDL Implementation Project: July 2009- June 2013

### Project Location

Looney Creek is located in Botetourt County, Virginia. The creek empties directly into the James River south of the Town of Buchanan. The Looney Creek watershed is approximately 40,000 acres with an estimated population of just over 4,100 people. The major land use in this watershed is forest. Looney Creek was listed as impaired on Virginia's 1998 303(d) list due to violations of the State's water quality standards for fecal coliform bacteria from the confluence of Mill and Back Creek to the James River confluence, a total of 2.48 miles. The VA Department of Environmental Quality completed a bacteria TMDL for Looney Creek in May 2004, and DCR completed the TMDL implementation plan in November 2007.



### Implementation Highlights

The Looney Creek TMDL implementation project is administered by the Mountain Castles Soil and Water Conservation District (MCSWCD). The table on the right shows BMPs implemented in the watershed since the project began in July 2009 and overall implementation goals for the project area. Landowner participation in the cost share program has been variable from year to year, with a considerable amount of livestock exclusion fencing going in between 2010 and 2011, but very little the following year.

Between July 1, 2012 and June 30, 2013, three livestock exclusion practice was completed resulting in 9,200 linear feet of stream exclusion fencing, 200 acres were placed under small acreage grazing system, and support was provided for 80 linear feet extension of CREP watering system in the watershed. In addition, four septic tank pumpouts, one septic system repair, two septic system replacement, and one alternative waste treatment system were completed. Pollution reductions resulting from BMPs installation since 2009 are summarized in the table below.

**Looney Creek BMP Summary: July 2009 – June 2013**

Control Measure**	Units*	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	68,583	31,228	46
Stream Exclusion Fencing	S	44	9	20
Riparian Buffer	Ac	-----	14	-----
Waste Storage Facility	S	2	1	50
Manure Incorporation	Ac	318	-----	0
Pasture Management	Ac	9,467	-----	0
Sinkhole Protection	F	4,000	-----	0
Veg. Buffer on Cropland	Ac	4	-----	0
Small Acreage Grazing	Ac	-----	200	-----
Extension of CREP Watering	F	-----	80	-----
<b>Residential</b>				
Pet Waste Digesters	S	453	-----	0
Vegetated Buffer	F	100,810	-----	0
<b>Residential Septic</b>				
Septic Tank Pump Out	S	100	16	16
Septic System Repair	S	16	7	44
Septic System Installation	S	77	6	8
Alternative Waste Treatment	S	10	2	20

\*NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously) \*Ac = Acres, S = System, F = Feet

**Pollution Reductions for Looney Creek: July 2009-June 2013**

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2012 – June 2013	4.87E+14	5,085	769	14
July 2009-June 2012	1.62E+15	10,304	1,546	939

## Current 319H Project Report - Mill and Hawksbill Creek TMDL Implementation Project: Jan 2008- June 2013



### Project Location

Mill Creek and Hawksbill Creek are located in Page County in the South Fork Shenandoah watershed. Hawksbill Creek runs through the Town of Luray. Mill Creek watershed is 8,178 acres and Hawksbill Creek watershed is 56,951 acres. The creeks were listed as impaired on Virginia's 1998 303(d) Total Maximum Daily Load Priority List and Report (DEQ, 1998) due to violations of the water quality standard for fecal coliform (modified listing for *E. coli*). The impaired segment includes Mill Creek from the headwaters to the confluence with the South Fork Shenandoah River (6.78 miles) and Hawksbill Creek from its headwaters downstream to its confluence with the South Fork Shenandoah River (19.3 miles).

### Implementation Highlights

The Mill and Hawksbill Creek TMDL implementation project is administered by the Shenandoah Valley Soil and Water Conservation District (SVSWCD). The table on the right shows BMPs implemented in the watersheds since the project began in January 2008 and overall implementation goals for the project areas.

The residential septic program has been a great success in Mill and Hawksbill Creeks, with the septic repair goal exceeded and the number of septic system replacements surpassing 50% of the implementation goal. Participation in the agricultural BMP program has not been as strong despite considerable outreach efforts on behalf of the SWCD. In this final year of the project, approximately 22% of the livestock exclusion goal has been achieved.

Between July 1, 2012 and June 30, 2013, 400 linear feet of stream exclusion fencing was installed in the watersheds. In addition, 78 septic tank pumpouts, 23 septic system repairs, and four replacements were completed. Pollution reductions resulting from BMPs installation since 2008 are summarized in the table below. These figures do not include the Urban/ Residential (non-septic) practices due the fact that the pollution reductions for these practices were not available at the time of this report.

### Mill and Hawksbill Creek BMP Summary: January 2008 – June 2013

Control Measure**	Units*	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	138,828	30,067	22
Stream Exclusion Fencing	S	62	18	29
Riparian Buffer	Ac	-----	89	-----
Voluntary Exclusion Systems	S	24	0	0
Waste Storage Facility	S	8	-----	0
Manure Incorporation	Ac	838	0	0
Pasture Management	Ac	14,739	0	0
Veg. Buffer on Cropland	Ac	9	26	289
<b>Urban/Residential</b>				
Pet Litter Control Program	P	1	0.5	50
Pet Waste Digesters	S	1,577	4	<0
Vegetated Buffer	Ac	12	0	0
<b>Residential Septic</b>				
Septic Tank Pump Out	S	936	273	29
Septic System Repair	S	57	83	146
Septic System Installation	S	60	31	52
Alternative Waste Treatment	S	32	3	9

\*NOTE: BMP counts after 7/1/2009 only include 319 funded projects. BMPs funded by State CS, CREP or Federal EQIP are not included after this date (though they may have been included previously) \*Ac = Acres, S = System, F = Feet

### Pollution Reductions for Mill and Hawksbill Creeks: January 2008-June 2013

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2012-June 2013	1.19E+14	1,160	79	106
January 2008-June 2013	2.13E+15	10,322	2,079	1,486

## Current 319H Project Report - Thumb, Deep, Carter and Great Runs TMDL Project July 2006- June 2013

### Project Location

Thumb Run, Carter Run, Great Run, and Deep Run are part of the Rapidan-Upper Rappahannock Basin in the Chesapeake Bay watershed. The Thumb Run, Carter Run and Great Run watersheds are located in Fauquier County, Virginia. The northern portion of Deep Run watershed lies in Fauquier County with the southern portion in Stafford County. The 92,800 acre project area is made up of forest (60%), agricultural (39%) and residential (1%) land uses. A TMDL implementation plan was developed to address a fecal coliform impairment on Thumb Run and *E. coli* impairments on Deep, Carter and Great Runs. Deep Run was first listed as impaired for fecal coliform on the 1996 303(d) list (DEQ, 1996). Thumb, Carter and Great Runs followed in 1998.



### Implementation Highlights

The Thumb, Deep, Carter and Great Runs TMDL implementation project is administered by the John Marshall Soil and Water Conservation District (JMSWCD) and the Fauquier County Health Department. The Health Department was contracted to provide technical assistance and educational outreach to homeowners while JMSWCD delivers the agricultural BMP program and associated education and outreach. The table on the right shows BMPs implemented in the watersheds since the project began in July 2006 and implementation goals established for the project areas. Of note, 34 miles of livestock stream exclusion fencing has been installed. Outreach efforts for the project have included newspaper articles, of mailing to landowners in the watersheds, and presentations to community organizations. Between July 2012 and June 2013, ten livestock exclusion projects were completed in the watersheds totaling approximately 32,815 feet of streamside fencing. In addition, 41 septic tank pumpouts, 21 septic system repairs and four replacements were completed.

The pollution reductions resulting from BMP installations beginning in 2006 are summarized in the table below.

### Thumb, Deep, Carter and Great Runs BMP Summary: July 2006 – June 2013

Control Measure**	Units*	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	421,947	179,265	42
Stream Exclusion Fencing	S	167	50	30
Riparian Buffer	Ac	-----	216	-----
Pasture Management	Ac	16,459	-----	0
Manure incorp. on cropland	Ac	5,331	-----	0
Veg. Cover on Cropland	Ac	-----	31	-----
Woodland Buffer Filter Area	Ac	-----	19	-----
<b>Urban/Residential Pet Waste</b>				
Pet Litter Control Program	P	3	-----	0
CCU BMP Demonstration*	S	2	-----	0
CCU BMP Installation*	S	25	-----	0
Pet waste landscape demo.	S	2	2	100
<b>Residential Septic</b>				
Septic Tank Pump Out	S	-----	243	-----
Septic System Repair	S	102	61	60
Septic System Installation	S	146	15	10
Alternative Waste Treatment	S	44	-----	0

\*Ac =Acres, S =System, F = Feet, P = Program, CCU = Concentrated Canine Unit

\*\* BMPs funded by State CS, CREP or Federal EQIP are not included after 7/1/2009 (though they may have been included previously)

### Pollution Reductions for Thumb, Deep, Carter and Great Runs: July 2006-June 2012

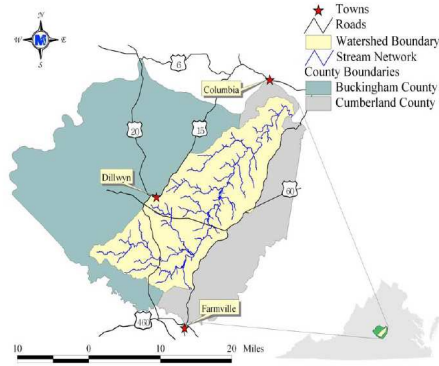
Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
July 2012-June 2013	1.54E+15	13,794	1,927	82
July 2006-June 2013	1.13E+16	57,627	9,839	8,512

## **Current 319H Project Report - Willis River TMDL Implementation Project: July 2005-June 2013**

### **Project Location**

Located approximately 60 miles west of Richmond in the Piedmont, the Willis River and its tributaries in Buckingham and Cumberland counties were first listed as not meeting water quality standards on Virginia's 1996 303(d) list of impaired waters. The impairment was due to violations of the State's fecal coliform bacteria standard for recreational contact. Through the joint efforts of the Virginia Department of Conservation and Recreation (DCR) and the Peter Francisco Soil and Water Conservation District (PFSWCD), as well as other stakeholders, various agricultural and residential best management practices (BMPs) have been installed through a TMDL implementation project funded with EPA Section 319(h) funds that began in 2005. These BMPs include: a dairy loafing lot management system, composting facilities, animal waste storage, and livestock stream exclusion with grazing

land protection systems, riparian buffers, septic tank pump-outs, septic system repairs and replacements.



### **Project Background and Problem Identification**

The Willis River watershed is part of the James River Basin (HUC 02080205, VAC-H35R and VAC H36R). The land area is approximately 177,936 acres, with woodlands and pasture as the primary land uses. The watershed is comprised of forest (75%), water (1%), wetlands (2%) agricultural (21%), and urban (1%) land uses.

In 1996, the Willis River was placed on the Commonwealth of Virginia's 1996 303(d) list because of violations of the fecal coliform bacteria water quality standard. The original 1996 impaired segment of the Willis River stretched from the confluence with the James River upstream to Reynolds Creek (14.53 miles). The segment was extended in the 2004 cycle to include the entire Willis River from the headwaters to the mouth (61.34 miles). The fecal coliform TMDL for the Willis River was completed in 2002. In 2005, DCR and Peter Francisco Soil and Water Conservation District, with extensive input from other stakeholders, completed a TMDL implementation plan and commenced a 5-year implementation project to reduce fecal coliform levels in the Willis River through implementation of agricultural and residential BMPs.

### **Project Highlights**

Residential and agricultural conservation successes have largely been the result of partnerships between the PFSWCD and several state agencies including the Virginia Departments of Conservation and Recreation and Environmental Quality, Virginia Cooperative Extension, Farm Bureau, Cattlemen's Association, and USDA – Natural Resources Conservation Service. Numerous tours have been held to promote the agricultural and residential BMPs offered under the TMDL implementation plan, along with presentations at civic clubs throughout the watersheds, postcard mailings advertising the program, personal contacts with farmers and residents, and meetings updating the community about the water quality improvements.

From July 1, 2012 thru June 30, 2013 one livestock stream exclusion practices were installed protecting 300 feet of stream. During this period 11 septic pump outs and two septic system repairs were also completed. Since the beginning of the project in July 2005 (through June 30, 2013), there have been 79 agricultural practices completed. Approximately 41.4 miles of stream fencing has been installed, establishing almost 166 acres of buffer. For the residential program, to date, 70 septic projects have been implemented including 54 septic tank pump out, 11 septic

systems repairs and five septic systems replacements. The pollution reductions as a result of the BMPs installed included at the bottom of the page are only for 319(h) funded practices.

The Virginia Department of Environmental Quality (DEQ) monitors the impaired streams through the agency's ambient monitoring program. DEQ monitors several stations throughout the Willis River Watershed. Analysis of data from several sites has shown significant improvements in the water quality conditions of various segments of the Willis River. Subsequently three stream reaches were delisted due to the bacteria violation rates being 10% or less. These sites include:

- VAC-H35R\_WLS02A04, 9.92 miles (station 2-WLS004.27), which had a violation rate of 2/20 with a 10% violation rate and was listed in the 2006 303(d)/305(b) report as attaining standards, and
- VAC-H36R\_WLS02A06, 8.11 miles, which had a violation rate of 1/20 with a less than 10% violation rate and was listed in the 2006 303(d)/305(b) report as attaining standards, and
- VAC-H36R\_WLS01A00, 16.68 miles (station 2-WLS042.78), which had a violation rate of 2/21 with a 9.5% violation rate and was listed in the 2008 303(d)/305(b) report as attaining standard.

As a result of activities a total of 34.71 miles are now meeting water quality standards and changed to category 2C. For the 2006 303(d) list the bacteria standard was based on fecal coliform, 400 colony forming units (CFU) per 100 ml of water. For the 2008 303(d) list the standard changed to *E. coli* at 235 CFU per 100 ml of water.

#### Willis River BMP Summary: August 2005-June 2013

Control Measure*	Unit	Units Needed	# Installed	% Goal
<b>Agricultural</b>				
Stream Exclusion Fencing	Miles	475,000	218,545	46
Stream Exclusion Fencing	System	318	61	19
Riparian Buffer Established	Acre		66	
Stream Crossing & Hardened Access	System		6	
Loafing Lot Management	System		1	
Animal Waste Storage Facility	System		4	
Composting Facility	System		3	
<b>Residential</b>				
Septic System Pump Out	System	100	54	54
Septic System Repair	System	3	11	367
Septic System Installation	System	2	5	250
<small>BMP counts after 7/1/2010 only include 319, WQIF and VNRFC funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been included previously)</small>				
<b>Water Quality Goals Met</b>	<b>Unit</b>	<b>Miles needed</b>	<b>Miles Delisted</b>	<b>% Goal</b>
Stream Miles impaired on 303(d) list	Miles	61	34.5	57

#### Pollution Reductions for the Willis River: August 2005-June 2013

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2005-June 2012	1.81E+16	6,435	1,264	1,202
July 2012-June 2013	8.85E+13	693	85	15
<b>TOTAL</b>	<b>1.82E+16</b>	<b>7,128</b>	<b>1349</b>	<b>1,217</b>



## **Current 319H Project Report - Slate River TMDL Implementation Project: July 2011-June 2013**

### **Project Location**

Located approximately 60 miles west of Richmond in the Piedmont, the Slate River and Rock Island Creek and its tributaries in Buckingham County were listed as not meeting water quality standards on Virginia's 2002 and 2004 303(d) lists of impaired waters. The impairment was due to violations of the State's bacteria standard for recreational contact. Through the joint efforts of the Virginia Department of Conservation and Recreation (DCR) and the Peter Francisco Soil and Water Conservation District (PFSWCD), as well as other stakeholders, a water quality improvement plan was started to install various agricultural and residential best management practices (BMPs) through a Total Maximum Daily Load (TMDL) implementation project funded with EPA Section 319(h) funds that began in July 2011.



During first year of the project, 10 farm visits and meetings were conducted to promote various agricultural and residential best management practices among the land owners of the watersheds. Three agricultural best management practices have been installed, including two stream exclusion fencing practices and one extension of CREP watering system. Also, 26 residential practices were completed during first year of the project.

### **Project Background and Problem Identification**

The Slate River and Rock Island Creek watersheds are located in Buckingham County and are part of the James River Basin (HUC 02080205). The Slate River watershed is approximately 156,940 acres, and is comprised of forest (87%), pasture/cropland (10%), water/wetland (2%), and residential (1%) land uses. The Rock Island Creek watershed is approximately 13,050 acres with forest as the primary land use (92%), followed by pasture/cropland (6%), water/wetland (2%), and residential (1%) land uses.

In 2002, the lower and upper Slate River and its tributaries (Frisby Branch and North River) were placed on the Commonwealth of Virginia's 303(d) list because of violations of the bacteria water quality standard. Rock Island Creek, Austin Creek and Troublesome Creeks were listed in 2004, also for violations of the bacteria standard. The impaired stream segments include 6.14 miles of Austin Creek, 3.83 miles of Frisby Branch, 8.44 miles of North River, 0.95 miles of Troublesome Creek, 16.92 miles of the Slate River, and 8.84 miles of Rock Island Creek. The Slate River empties into the James River, and Rock Island Creek, a tributary of the James River, empties into the James west of the confluence of the Slate and James Rivers.

The bacteria TMDL study for the Slate River and Rock Island Creek was completed by DEQ in 2007. In 2010, DCR and Peter Francisco Soil and Water Conservation District, with input from other stakeholders, completed a TMDL implementation plan and commenced the implementation project to reduce bacteria levels in the Slate River and Rock Island Creek watersheds. The implementation project also covers Muddy Creek and Turpin Creek, which were listed as impaired due to excess bacteria after completion of the TMDL study.

### **Project Highlights**

Numerous field visits were conducted to promote the agricultural and residential BMPs offered under the TMDL implementation plan, along with postcard mailings advertising the program and personal contacts and meetings with farmers and residents about the water quality improvement programs.

From July 1, 2012 through June 30, 2013, 30 acres of reforestation of erodible crop and pastureland was completed, along with 4 septic tank pump outs, two septic system installations/replacements, and two alternate on-site systems were installed.

**Slate River and Rock Island Creek BMP Summary:  
July 2011-June 2013**

Control Measure*	Unit	Units Needed	# Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	Feet	1,367,520	2,190	<1
Stream Exclusion Fencing	System	406	2	<1
Extension of CREP Watering System	Acre		48	
Reforestation of Erodible Crop & Pastureland	Acre	30	47	157
<b>Residential</b>				
Septic System Pump Out	System	187	27	14
Septic System Repair	System	90	0	0
Septic System Installation	System	97	5	5
Alternate On-Site System	System	4	2	50
*NOTE: BMP counts after 7/1/2010 only include 319, WQIF and VNRCF funded projects. BMPs funded by State CS CREP or Federal EQIP are not included after this date (though they may have been included previously)				

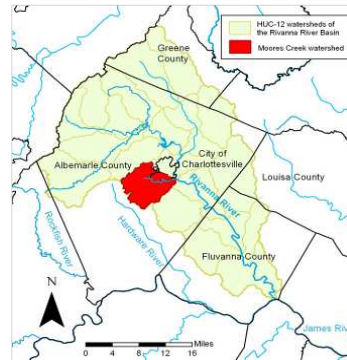
**Pollution Reductions for the Slate River and Rock Island Creek: July 2011-June 2013**

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
July 2012-June 2013	7.67E+13	1,438	173	11
July 2011-June 2012	1.34E+11	600	69	96
<b>Total</b>	<b>7.67E+13</b>	<b>2,038</b>	<b>242</b>	<b>107</b>

## Current 319H Project Report - Moores Creek TMDL Implementation Project: January 2012-June 2012

### Project Location

Moores Creek watershed is located within the Middle James watershed and drains 31.49 square miles of Albemarle County and 3.49 square miles of the City of Charlottesville, for a total drainage area of 34.92 square miles. Moores Creek flows approximately 11 miles from its source in the Ragged Mountains to its confluence with the Rivanna River in Charlottesville. The watershed is predominantly forested, with residential areas, grasslands, and urban areas being the other major land uses. Moores Creek was first listed as impaired due to violations of the State's water quality standard for fecal coliform on Virginia's 1998 303(d) *Total Maximum Daily Load Priority List and Report* (DEQ, 1998). The 6.37 mile impaired segment extends from the intersection of U.S. Route 29 and County Route 1106 to the confluence of the Rivanna River.



### Project Background

A TMDL for the bacteria impairment on Moores Creek was completed by DEQ and approved by EPA in 2002. A TMDL implementation plan was completed by the Thomas Jefferson Planning District Commission in 2003; however, it did not meet the nine eligibility criteria to receive EPA Section 319 funding. In 2012, DCR contracted the Rivanna River Basin Commission (RRBC) to complete an update to the implementation plan in order to meet the funding criteria and provide funding to the RRBC to implement the plan. The update was completed and approved by EPA in 2012. During the revision process, the RRBC led the formation of a partnership to support implementation efforts that included Albemarle County and the City of Charlottesville, the Thomas Jefferson SWCD, the Albemarle County Health Department, the Rivanna Water and Sewer Authority, StreamWatch, The University of Virginia, The Rivanna Conservation Service, and the Thomas Jefferson Planning District Commission. This partnership has a strong history of working together on water quality projects throughout the Rivanna River Basin. The partnership collaborated on completion of the revised implementation plan as well as planning and implementation of the Moores Creek TMDL implementation project.

### Project Goals

EPA 319(h) funds are currently being used to support project technical staff, the implementation of a residential septic program, a pet waste education program and water quality monitoring. DCR has awarded the Thomas Jefferson SWCD with funding from the VA Natural Resources Commitment Fund for agricultural BMP cost share in the watershed. Specific implementation goals for this 2 ½ year project are summarized in the table below.

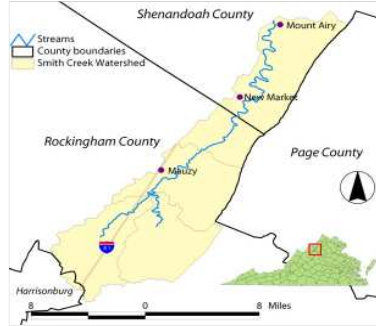
Program	Control measure	Units	Extent
Residential septic	Septic tank pumpout	Pumpout	40
	Connection to public sewer	Connection	1
	Septic system repair	Repair	4
	Septic system replacement	System	2
	Alternative waste treatment system	System	1
Pet waste	Pet waste digesters (including 1 pet waste to energy digester)	Digester	76
	Pet waste education program	Program	1
Agriculture	Livestock exclusion (including rotational grazing system)	System	5

As implementation efforts progress in Moores Creek, these grant deliverables will be tracked in conjunction with TMDL implementation plan goals to assess progress towards achieving water quality standards.

## Current 319H Project Report - Smith Creek TMDL Implementation Project: January 2012-June 2013

### Project Location and Background

The Smith Creek watershed is located in the Potomac River Basin in Shenandoah and Rockingham counties, with a small portion of the headwaters located in the City of Harrisonburg, Virginia. The watershed is approximately 67,900 acres in size and land use is predominantly forest and agricultural. Smith Creek was listed as impaired on Virginia's *Section 303(d) Total Maximum Daily Load Priority List and Report* due to violations of the State's Water Quality Standards for fecal coliform bacteria and violations of the General Standard (benthic) (VADEQ 1998, 2002). The Smith Creek TMDLs were completed in April 2004 and approved by EPA in June 2004. A stressor analysis was performed during development of the benthic TMDL, and sediment was identified as the primary stressor causing the aquatic life use impairment in Smith Creek. A TMDL implementation plan was completed for Smith Creek in February 2009. Shortly after completion of the implementation plan, Smith Creek was designated as a Showcase Watershed by NRCS.



### Implementation Highlights

The Smith Creek TMDL implementation project is administered by the Shenandoah Valley Soil and Water Conservation District (SVSWCD). The table on the right shows BMPs implemented in the watersheds since the project began in January 2012 and overall implementation goals.

**Smith Creek BMP Summary:  
January 2012 – June 2013**

Control Measure**	Units*	Needed	Installed	%
<b>Urban/Residential</b>				
Pet waste program	P	1	Ongoing	100
Street sweeping	Ac	7	0	0
Vegetated buffer	Ac	44	0	0
Rain gardens	Ac	109	0	0
Bioretention filters	Ac	45	0	0
<b>Residential Septic</b>				
Septic tank pump out	S	1,108	31	3
Connection to public sewer	S	7	0	0
Septic system repair	S	8	4	50
Septic system installation	S	19	0	0
Alternative waste treatment	S	70	1	1

\* Ac = Acres, S = System, F = Feet of stream, P = Program

The residential septic program has been picking up momentum in the Smith Creek watershed over the past several months, though participation was initially slow to start. Between July 1, 2012 and June 30, 2013, 29 septic tank pumpouts and four septic system repairs were completed. Pollution reductions resulting from these BMP installations are summarized in the table below. In addition, the SWCD has been working with the Center for Watershed Protection to identify suitable locations for a series of stormwater management BMPs, which will be installed in the watershed in 2014. The SWCD also worked with the Town of New Market to install a pet waste station in a public park. The Smith Creek Partnership, which formed as a result of the Showcase Watershed Designation, has provided assistance with program outreach including articles in newsletters distributed to watershed landowners and other promotional materials. The Showcase Watershed Designation has resulted in considerable targeting of resources to encourage agricultural BMP implementation, though it is not captured in this report. Consequently, agricultural BMP goals included in the TMDL IP are not shown in the table above.

**Pollution Reductions for Smith Creek: July 2012-June 2013**

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
January 2012-June 2013	2.94E+11	174	0	33

## Current 319H Project Report - Craig, Brown and Marsh Runs TMDL Implementation Project: July 2012-June 2013

### Project Location and Background

The Craig, Browns, and Marsh Run watersheds are located in Fauquier County, VA in the Rappahannock River Basin. The watersheds comprise approximately 29,400 acres, with agriculture and forest as the predominant land uses. Marsh Run, Browns Run, and Craig Run were initially placed on Virginia's *Section 303(d) Total Maximum Daily Load Priority List and Report* in 1996, 2002, and 2004 respectively for exceeding the bacteria standard. Bacteria TMDLs were completed for the creeks in April 2007 as part of the Rappahannock River Basin TMDL, which was approved by EPA in January 2008. A TMDL implementation plan was completed for Craig, Browns and Marsh Runs in November 2010.



### Implementation Highlights

The John Marshall SWCD administers the implementation project for the Craig, Brown and Marsh Runs TMDLs. The SWCD was awarded funds for agricultural and residential BMP implementation in July 2012. The SWCD is working to implement education and outreach strategies that have proven successful in other TMDL implementation project areas including working with home owner associations, community based organizations and local businesses to increase awareness of local water quality issues and the availability of the cost-share assistance. Both the agricultural and residential BMP programs are off to a good start, with nearly 20,000 feet of livestock exclusion fencing installed within the first year of the project and two septic system replacements and one repair completed. A summary of the BMPs installed since this project began is provided in the table on the right. Associated pollutant reductions are shown in the table below.

**Pollution Reductions for Craig, Brown and Marsh Runs: July 2012-June 2013**

Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
9.40E+14	4,893	706	18

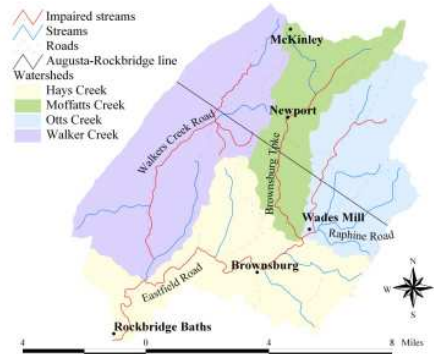
Control measure	Units*	Extent needed	Extent installed	%
<b>Agricultural</b>				
Livestock exclusion fencing	F	343,200	19,380	6
Livestock exclusion fencing	S	93	4	4
Improved pasture mgmt.	Ac	14,544	0	0
Retention ponds	AT	7,688	0	0
Manure incorporation	Ac	348	0	0
Reforestation of pasture or cropland	Ac	80	0	0
Permanent vegetative cover on cropland	Ac	80	0	0
<b>Urban Stormwater</b>				
Vegetated buffers	AT	28	0	0
Bioretention filters	AT	170	0	0
Infiltration trench	AT	20	0	0
<b>Residential</b>				
Septic tank pumpout	S	40	8	20
Connection to public sewer	S	5	0	0
Septic system repairs	S	266	1	<1
Septic system replacements	S	138	2	1
Alternative waste treatment system	S	44	0	0
Pet waste education program	P	1	Ongoing	100
Pet waste digesters	S	50	0	0
Confined canine unit waste treatment system	S	4	0	0

\* Ac = Acres, AT = Acres treated, S = System, F = Feet of stream, P = Program

## Current 319H Project Report - Hays Creek TMDL Implementation Project: October 2012-June 2013

### Project Location and Background

The Hays Creek watershed is located in the Upper James River Basin in Augusta and Rockbridge counties, Virginia. The watershed is approximately 51,500 acres in size and land use is predominantly forest and agricultural. Hays Creek and its tributaries (Otts, Moffatts and Walker Creeks) were listed as impaired on Virginia's 1998 Section 303(d) Total Maximum Daily Load Priority List and Report due to violations of the State's Water Quality Standards for fecal coliform bacteria and violations of the General Standard (benthic). The Hays Creek TMDL was completed in January 2008 and a TMDL implementation plan was completed in December 2010.



### Implementation Highlights

The Hays Creek TMDL implementation project is administered by the Natural Bridge Soil and Water Conservation District (NBSWCD) in partnership with the Headwaters SWCD. The project area spans the coverage areas of the two SWCD's, allowing for a collaborative approach to implementation. The table on the right shows BMPs implemented since the project began in October 2012 and overall implementation goals for the project areas.

The agricultural program has been picking up momentum in the Hays Creek watershed over the past several months, though participation was initially slow to start. As the agricultural community has learned more about the program and BMP options available to them, SWCD staff has begun responding to more and more requests for program information. Between July 1, 2012 and June 30, 2013, 4,486 feet of stream exclusion fencing was installed and 3.6 acres of riparian buffers were established. Pollution reductions resulting from these BMP installations are summarized in the table below. The residential septic program has been slower to start with no BMPs completed during this reporting period.

### Hays Creek BMP Summary: October 2012 – June 2013

Control Measure	Units*	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	353,062	4,486	1
Stream Exclusion Fencing	S	115	4	3
Riparian Buffer	Ac	275	3.6	1
Improved pasture mgmt.	Ac	23,356	0	0
Reforestation of highly erodible pasture	Ac	1,000	0	0
Sediment retention structure	Ac	1.85	0	0
Sod waterways	Ac	49	0	0
Continuous no till	Ac	502	0	0
Veg. buffer on cropland	Ac	73	0	0
Poultry litter storage	S	3	0	0
Dry manure storage	S	11	0	0
<b>Residential Septic</b>				
Septic Tank Pump Out	S	66	0	0
Septic System Repair	S	90	0	0
Septic System Installation	S	28	0	0
Alternative Waste Treatment	S	57	0	0

\* Ac = Acres, S = System, F = Feet of stream

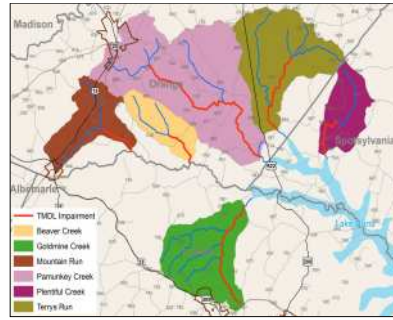
### Pollution Reductions for Hays Creek: October 2012-June 2013

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation-Siltation tons/year
October 2012-June 2013	2.67E+14	1,295	252	4

## Current 319H Project Report – Upper York River Basin Watershed

**Implementation Project: July 2012- June 2013****Project Location**

The project area consisting of multiple impaired watersheds is located in Orange County, Virginia. Beaver Creek, Mountain Run, Pamunkey Creek, and Terrys Run were initially placed on the Commonwealth of Virginia's Section 303(d) List of Impaired Waters in 1998 for exceedances of the bacteria standard. Mountain Run and Beaver Creek flow south and drain into the North Anna River. Pamunkey Creek and Terrys Run drain directly into Lake Anna. Mountain Run watershed area (9,464 acres) consists of forest (50%), pasture/hayland (43%), residential (3%), water/wetland (2%), and cropland (2%). Beaver Creek watershed (6,315 acres) is mainly a forested watershed (about 88%) with pasture/hayland (9%) and water/wetland (3%) of the area. Pamunkey Creek watershed (34,382 acres) is comprised of forest (54%), pasture/hayland (36%), cropland (7%), residential (2%), and water/wetland (1%). The 18,614 acres in the Terrys Run watershed consists of forest (58%), pasture/hayland (29%), cropland (12%), and the remaining 1% split between residential and water/wetland land uses. A TMDL implementation plan was developed in 2011 to address these bacteria impairments.



**Upper York River Basin BMP Summary:  
July 2012 – June 2013**

**Implementation Highlights**

The implementation project is administered by the Culpeper Soil and Water Conservation District. The District was contracted to provide technical assistance and educational outreach to farmers and homeowners for agricultural and residential BMP implementation. The table on the right shows BMPs implemented in the watersheds since the project began in July 2012 and implementation goals established for each of the control measures. Outreach efforts for the project have included various meetings, newspaper articles, of mailing to landowners in the watersheds, and presentations to community organizations. Between July 2012 and June 2013, under Agricultural BMP program, 13,926 linear feet of livestock exclusion stream fencing was installed. Under residential program, eight septic tank pumpouts, one septic system repair, and five septic system replacements were completed in the watersheds.

Control Measure**	Units*	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F	744,480	13,926	<1
Stream Exclusion Fencing	S	320	2	<1
Pasture Management	Ac	26,966	-----	0
Reforestation of Erodible	Ac	336	-----	0
Manure incor. Into Soil	Ac	2,320	-----	0
Veget. Cover on Cropland	Ac	346	-----	0
Vegetated Buffer	Ac	60	-----	0
<b>Urban/Residential Pet Waste</b>				
Pet Waste Digester	S	120	-----	0
CCU Waste Treat. System	S	7	-----	0
New Conventional Septic	S	49	-----	0
Pet waste Education Program	P	3	-----	0
<b>Residential Septic</b>				
Septic Tank Pump Out	S	514	8	1
Septic System Repair	S	302	1	<1
Septic System Installation	S	152	5	3
Alternative Waste Treatment	S	50	0	0

\*Ac = Acres, S = System, F = Feet, P = Program, CCU = Concentrated Canine Unit

The pollution reductions resulting from BMP installations are summarized in the table below.

**Pollution Reductions for Upper York River Watershed: July 2012-June 2013**

Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
July 2012-June 2013	2.202E+14	586	50	16



## Other Project Report – Robinson River and Little Dark Run TMDL Implementation Project: July 2012- June 2013

### Project Location

The Upper Robinson River drains into the Rapidan River, which joins Rappahannock River then empties into the Chesapeake Bay. The Upper Robinson River and Little Dark Run watersheds are located in Madison County, Virginia. The Lower Robinson River watershed runs along border between Madison and Culpeper Counties. The 30,892 acre of Upper Robinson River watershed is mainly made up of forest (84%), agricultural (15%), , and residential (1%). The 124,326 acre of Lower Robinson River watershed has forest (64%), agricultural (34%), and residential and wetland/water (2%). The 2,334 acre of Little Dark Run watershed has forest (58%), agricultural (29%), residential (12%), and water/wetland (1%). The Upper and Lower Robinson River and Little Dark Run were initially listed as impaired for bacteria on the Commonwealth of Virginia's Section 303(d) List of Impaired Waters in 1994, 2002, and 2004 , respectively. A TMDL implementation plan was developed in 2011 to address these bacteria impairments.



### Implementation Highlights

The Little Dark Run and Robinson River implementation project is administered by the Culpeper Soil and Water Conservation District. The District was contracted to provide technical assistance and educational outreach to farmers and homeowners for residential BMP implementations. The table on the right shows BMPs implemented in the watersheds since the project began in July 2012 and implementation goals established for each of the project areas. Outreach efforts for the project have included newspaper articles, of mailing to landowners in the watersheds, and presentations to community organizations. Between July 2012 and June 2013, 97 septic tank pumpouts, nine septic system repairs, seven septic system replacements, and one alternative waste treatment system were completed in the watersheds.

The pollution reductions resulting from BMP installations are summarized in the table below.

### Robinson River and Little Dark Run BMP Summary: July 2012 – June 2013

Control Measure**	Units*	Needed	Installed	%
<b>Agricultural</b>				
Stream Exclusion Fencing	F		-----	0
Stream Exclusion Fencing	S	562	-----	0
Pasture Management	Ac	37,250	-----	0
Reforestation of Erodible	Ac	165	-----	0
Manure incorp. Into Soil	Ac	1,363	-----	0
Veg. Cover on Cropland	Ac	325	-----	0
<b>Urban/Residential Pet Waste</b>				
Pet Waste Digester	S	35	-----	0
CCU Waste Treat. System	S	3	-----	0
New Conventional Septic	S	116	-----	0
Pet waste Education Program	P	1	-----	0
<b>Residential Septic</b>				
Septic Tank Pump Out	S	364	97	27
Septic System Repair	S	436	9	2
Septic System Installation	S	219	7	3
Alternative Waste Treatment	S	85	1	1

\*Ac =Acres, S=System, F = Feet, P = Program, CCU = Concentrated Canine Unit

### Pollution Reductions for Robinson River and Little Dark Run: July 2012-June 2013

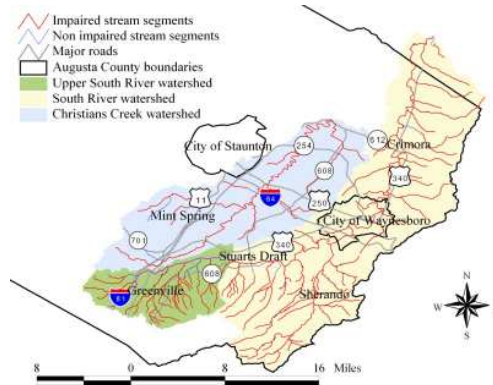
Period	Pathogens (Coliform) CFU	Nitrogen Lbs/year	Phosphorus Lbs/year	Sedimentation- Siltation tons/year
July 2012-June 2013	1.12E+12	665	-	114

## State Project Report - Christians Creek and South River TMDL



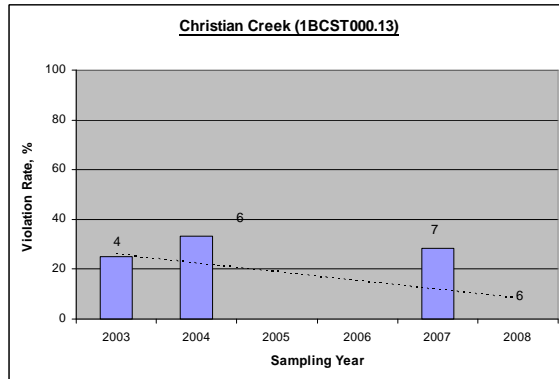
### Implementation Project:

The Christians Creek and South River implementation project for bacteria, sediment and phosphorus impairments was initiated in 2006. DCR contracted with the Headwaters Soil and Water Conservation District and provided funding through the Water Quality Improvement Fund (WQIF) for project implementation. The project is now in its seventh year of agricultural BMP implementation. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2013. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$597,872.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (57,249 linear feet), and CRWP-2 practice (1,440 linear feet) and the TMDL fencing practices: LE-1T (17,340 linear feet), LE-2T (7,151 linear feet), and SL-6 (45,802 linear feet). This totals 24 miles of livestock stream exclusion fencing installed.

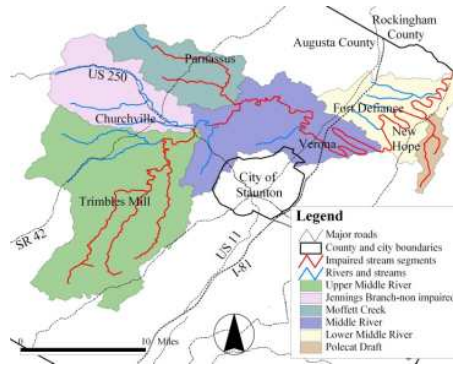
The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Christians Creek and the South River from the Impaired Waters List. The bar graph shows the percent violation rates for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graphs. A linear trend fitted to the Christians Creek data shows a significant decreasing trend in violation rate over the sampling period, but no samples have been collected since 2008. The decreasing trends in violation rates indicate significant improvement in water quality conditions in Christians Creek.



Practice Code	Extent Installed	Unit
CRFR-3	128	Acres
CRLF-1 (buffer)	5,800	Lin. Feet
CRSL-6	57,249	Lin. Feet
CRWP-2	1,440	Lin. Feet
FR-1	22	Acres
LE-1T	17,340	Lin. Feet
LE-2T	7,151	Lin. Feet
NM-3	311	Acres
NM-4	128	Acres
SL-1	374	Acres
SL-6	45,802	Lin. Feet
SL-7T	6	Acres
SL-8B	3,640	Acres
SL-8H	3,312	Acres
WL-1	6	Acres
WL-2	2	Acres
WL-3	9	Acres
WP-4	4	System
WQ-4	65	Acres

## State Project Report - Moffett Creek, Middle River and Polecat Draft TMDL Implementation Project :

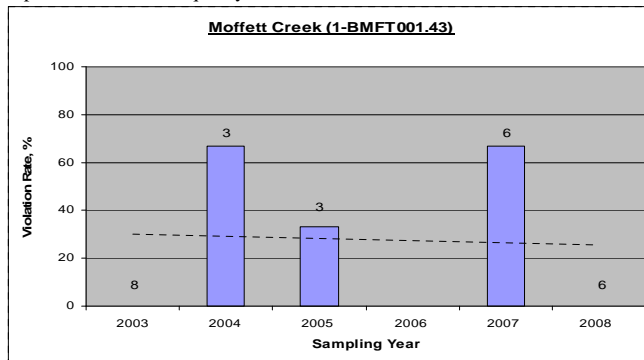
The Moffett Creek, Middle River and Polecat Draft implementation project for bacteria impairments in all three watersheds and sediment impairments in the Moffett Creek and the Upper Middle River was initiated in 2006. DCR contracted with the Headwaters Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its seventh year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2013. BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$1,310,825. The change in water quality reflects the cumulative impact of BMPs implemented.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (75,271 linear feet), and CRWP-2 practice (2,389 linear feet), and through TMDL fencing practices: LE-1T (19,442 linear feet), LE-2T (8,880 linear feet), and SL-6 (140,159 linear feet). This totals 51 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Moffett Creek, Middle River, and Polecat Draft from the Impaired Waters List.

The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the Moffett Creek data shows a slight decreasing trend in violation rates over the sampling period, indicating some improvement in water quality conditions in Moffett Creek.

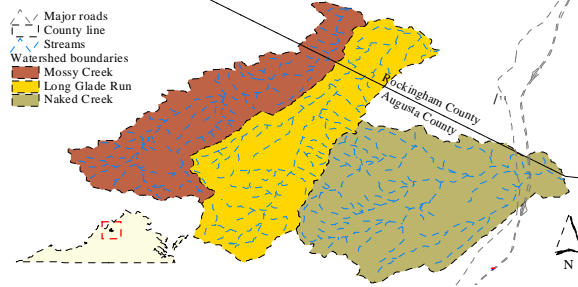


**Moffett Creek, Middle River & Polecat Draft BMP Summary: 2006-2013**

Practice Code	Extent Installed	Units
CRFR-3	332	Acres
CRLF-1 (buffer)	9,611	Lin. Feet
CRSL-6	75,271	Lin. Feet
CRWP-2	2,389	Lin. Feet
FR-1	40	Acres
LE-1T	19,442	Lin. Feet
LE-2T	8,880	Lin. Feet
NM-3	1,440	Acres
SL-1	815	Acres
SL-6	140,159	Lin. Feet
SI-7T	4	Acres
SL-8B	6,204	Acres
SL-8H	8,220	Acres
SL-11	1	Acres
WL-1	25	Acres
WL-2	30	Acres
WL-3	18	Acres
WP-2	22,045	Lin. Feet
WP-4	7	System
WP-4B	1	System
WP-4C	2	Facility
WQ-1	11	Acres
WQ-4	472	Acres

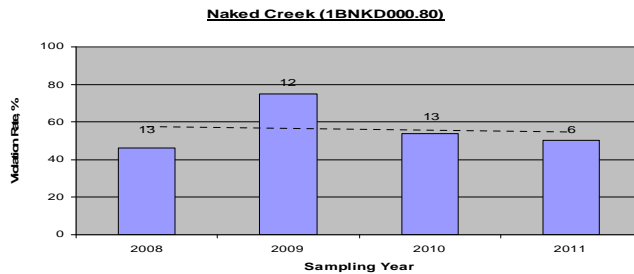
## State Project Report - Mossy Creek, Naked Creek & Long Glade Run TMDL Implementation Project

The Mossy and Naked Creeks and Long Glade Run implementation project for bacteria impairments in all three watersheds and aquatic life impairment attributed to sediment in Mossy Creek was initiated in 2006. DCR contracted with the Headwaters Soil & Water Conservation District and provided funding from the Water Quality Improvement Fund (WQIF) for project implementation. The project is now in its seventh year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2013. BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$574,379. DCR and the Headwaters Soil and Water Conservation District decided to scale back targeted TMDL funding in FY13 and fund only stream exclusion practices. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (10,830 linear feet), and CRWP-2 practice (3,800 linear feet) and the TMDL fencing practices: LE-1T (8,425 linear feet), LE-2T (4,085 linear feet), and SL-6 (29,895 linear feet). This totals 10 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Mossy and Naked Creeks and Long Glade Run from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. Data for Naked Creek shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in Naked Creek.

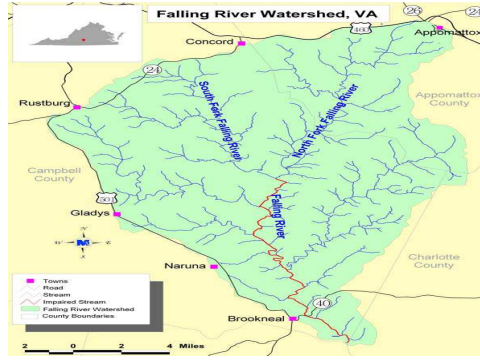


**Mossy & Naked Creeks &  
Long Glade Run BMP Summary  
2006-2013**

Practice Code	Extent Installed	Unit
CRFR-3	85	Acres
CRLF-1 (buffer)	15,311	Lin. Feet
CRSL-6	10,830	Lin. Feet
CRWP-2	3,800	Lin. Feet
LE-1T	8,425	Lin. Feet
LE-2T	4,085	Lin. Feet
SL-1	65	Acres
SL-6	29,895	Lin. Feet
SL-7T	7	Acres
SL-8B	3,267	Acres
SL-8H	2,183	Acres
WL-1	2	Acres
WL-2	33	Acres
WL-3	35	Acres
WP-4	4	System
WQ-4	259	Acres

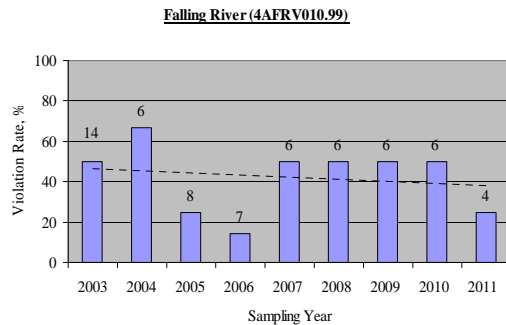
## State Project Report - Falling River TMDL Implementation Project

The Falling River implementation project for bacteria impairment was initiated in 2006. DCR contracted with the Robert E. Lee Soil and Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its seventh year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2013. These BMPs were funded with state WQIF/VNRFCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$1,506,892. From July 1, 2012 through June 30, 2013 eight livestock exclusion practices were installed, and 96 acres of pasture were signed up under the pasture management BMP (SL-10T). The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.



A considerable amount of stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (29,480 linear feet), and the TMDL fencing practices: LE-1T (108,029 linear feet), LE-2T (3,750 linear feet), SL-6 (94,936 linear feet), and WP-2T (14,700 linear feet). This totals 48 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Falling Creek from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the data shows a slight decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates some improvement in water quality condition in the Falling River.

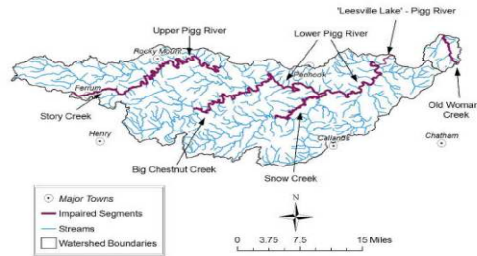


**Falling River BMP Summary: 2006-2013**

Practice Code	Extent Installed	Unit
CRFR-3	98	Acres
CRSL-6	29,480	Lin. Feet
CRWQ-1	6	Acres
FR-1	198	Acres
LE-1T	108,029	Lin. Feet
LE-2T	3,750	Lin. Feet
NM-1	1,020	Acres
NM-2	697	Acres
SL-6	94,936	Lin. Feet
SL-6B	6,664	Acres
SL-7T	19	Acres
SL-8B	1,786	Acres
SL-8H	1,550	Acres
SL-10T	96	Acres
SL-11	2	Acres
WP-2A	255	Lin. Feet
WP-2T	14,700	Lin. Feet
WP-3	3	Acres

## State Project Report - Pigg River TMDL Implementation Project (Blue Ridge SWCD)

The Pigg River implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Blue Ridge and Pittsylvania Soil and Water Conservation Districts and provided funding from the Water Quality Improvement Fund (WQIF) for implementation. Project summary provided includes progress made by the Blue Ridge SWCD in the Upper Pigg River, Story Creek, Chestnut Creek, and Snow Creek watersheds. The project is now in its seventh year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watersheds within the period of 2006 through June 2013. These BMPs were funded with state WQIF/VNRFCF targeted TMDL cost-share funds. The total cost-share payments for BMPs installed throughout the project period are \$1,425,455. Blue Ridge Soil and Conservation District installed 18 on-site sewage disposal practices in the watershed in FY13, these included replacement of 16 failing septic systems and the repair of two septic systems. Funds were provided through a Water Quality Improvement Fund grant award from DCR. The change in water quality reflects the cumulative impact of BMPs implemented in the watershed.

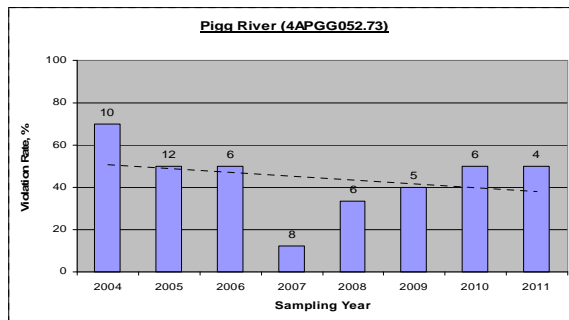


The stream fencing has been installed through the TMDL fencing practices: LE-1T (109,280 linear feet), LE-2T (1,784 linear feet), and SL-6 (57,500 linear feet). This totals 32 miles of livestock stream exclusion fencing installed which is 55 percent of the fencing goal quantified in the TMDL implementation plan.

**Pigg River BMP Summary (Blue Ridge SWCD): 2006-2013**

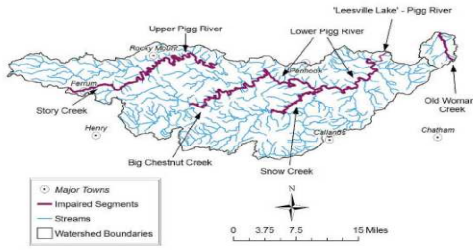
Practice	Extent	Unit
FR-1	82	Acres
LE-1T	109,280	Lin. Feet
LE-2T	1,784	Lin. Feet
SL-6	57,500	Lin. Feet
SL-8B	3,192	Acres
SL-8H	2,953	Acres
SL-11	10	Acres
WP-4	2	System
WP-4B	8	System
RB-3	2	System
RB-4	14	System
RB-4P	2	System

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove the impaired stream segments from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A trend fitted to the data at river mile 52.73 shows a significant decreasing trend in violation rates over the sampling period. The decreasing trend in violation rates indicates improvement in water quality conditions in the Pigg River.

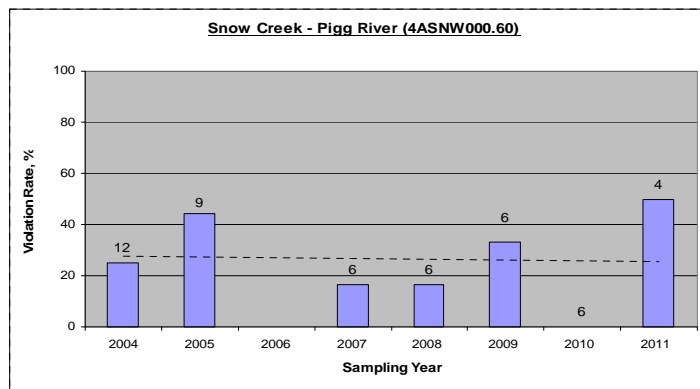


## State Project Report - Pigg River TMDL Implementation Project (Pittsylvania SWCD)

The Pigg River implementation project including Story, Snow, Chestnut Creeks and the Pigg River mainstem for bacteria impairments was initiated in 2006. DCR contracted with the Blue Ridge and Pittsylvania Soil & Water Conservation Districts and provided Water Quality Improvement Funds (WQIF) towards the project implementation. This summary includes project progress made by year in Pittsylvania SWCD in the Lower Pigg River and Snow Creek watersheds. The project completed seven years of implementation of various agricultural BMPs. The table below lists all BMPs implemented in the watershed within the period of 2006 through June 2013. This project did not receive any additional cost-share funding for FY14. These BMPs were funded with state WQIF/VNRCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$654,888. The violation rate of the bacteria standard did not change in Snow Creek during the project period (see graph below). Stream fencing has been installed through the TMDL fencing practices: LE-1T (19,174 linear feet), SL-6 (20,348 linear feet), CRSL-6 (1,380 linear feet), and WP-2T (14,179 linear feet). This totals 11 miles of livestock stream exclusion fencing installed.



The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Pigg River (Pittsylvania SWCD) from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. The linear trend fitted to Snow Creek shows a slightly decreasing trend in the violation rates, indicating only a slight improvement in water quality.

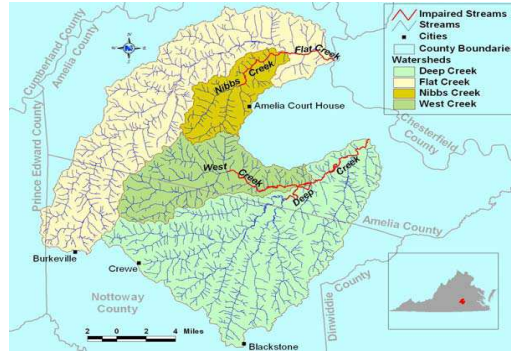


**Pigg River (Pittsylvania SWCD)  
BMP Summary: 2006-2013**

Practice Code	Extent Installed	Unit
CRSL-6	1,380	Lin. Feet
FR-1	34	Acres
LE-1T	19,174	Lin. Feet
SL-1	145	Acres
SL-5	1,461	Lin. Feet
SL-6	20,348	Lin. Feet
SL-8	65	Acres
SL-8B	485	Acres
SL-8H	228	Acres
WP-2T	14,179	Lin. Feet
WP-4	4	System
RB-4	1	System

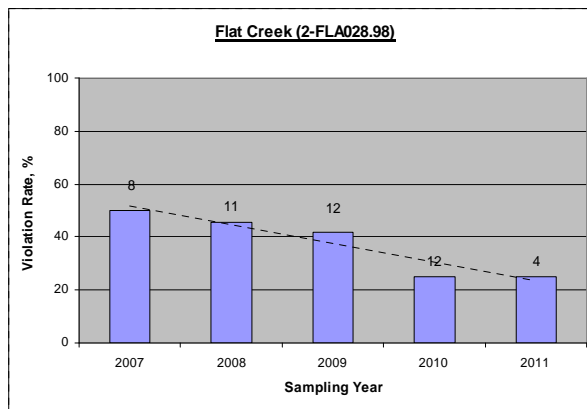
## State Project Report - Flat, Nibbs, Deep and West Creeks TMDL Implementation Project

The Flat, Nibbs, Deep, and West Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Piedmont Soil and Water Conservation District and provided Water Quality Improvement Funds (WQIF) towards the project implementation. The project is now in its seventh year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2013. These BMPs were funded with state WQIF/VNRFCF targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$886,945. The change in water quality reflects the cumulative impact of all BMPs implemented in the watershed.



Stream fencing practices have been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (17,154 linear feet) and the state fencing practices: LE-1T (52,649 linear feet), LE-2T (11,100), SL-6 (45,489 linear feet), SL-6T (6,803 linear feet), and WP-2T (29,809 linear feet). This totals 31 miles of livestock stream exclusion fencing installed. A total of 180 acres have been enrolled under a new pasture management BMP.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove the impaired creeks from the Impaired Waters List. The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year are shown above each bar within the graph. The trend fitted to the data at river mile 28.98 shows a significant decreasing trend in the violation rates over the sampling period. The decreasing trend indicates significant improvement in water quality conditions in Flat Creek.



**Flat, Nibbs, Deep & West Creeks  
BMP Summary: 2006-2012**

Practice Code	Extent Installed	Unit
CP-CNT	111	Acres
CRFR-3	49	Acres
CRSL-6	17,154	Lin. Feet
FR-1	130	Acres
LE-1T	52,649	Lin. Feet
LE-2T	11,100	Lon. Feet
NM-3B	55	Acres
SL-1	174	Acres
SL-6	45,489	Lin. Feet
SL-6T	6,803	Lin. Feet
SL-8B	2,590	Acres
SL-8	38	Acres
SL-8H	3,973	Acres
SL-10T	180	Acres
SL-11	1	Acres
SL-15A	146	Acres
SL-15B	176	Acres
WP-2T	29,809	Lin. Feet
WP-3	1,477	Acres
WP-4	3	Systems
WQ-4	1,471	Acres



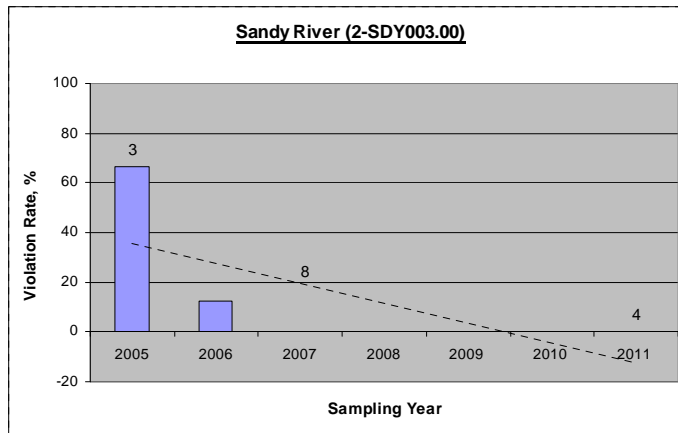
## State Project Report - Spring, Briery & Saylers Creeks, Little Sandy & Bush Rivers TMDL Implementation Project

The Spring Creek, Little Sandy River, Bush River, Briery and Saylers Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Piedmont Soil & Water Conservation District and provided Water Quality Improvement Funds (WQIF) for BMP implementation. The project is now in its seventh year of the implementation of various agricultural BMPs. The table below lists BMPs implemented in the watershed within the period of 2006 through June 2013. These BMPs were funded with state WQIF/VNRFCF targeted TMDL cost-share funds. The total cost- share payments for these BMPs were \$879,180. The change in water quality reflects the cumulative impact of all BMPs implemented in the watershed.

A considerable amount of stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 practice (38,212 linear feet), and the TMDL fencing practices: LE-1T (70,247 linear feet), LE-2T (1,700 linear feet), SL-6 (65,841 linear feet), SL-6T (10,237 linear feet), WP-2 (2,993 linear feet) and WP-2T (10,994 linear feet). This totals 38 miles of livestock stream exclusion fencing installed. Water source has been extended to 23 acres for grazing management and 47 acres have been enrolled under a new pasture management BMP.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Spring Creek, Little Sandy River, Bush River, and Briery and Saylers Creeks from the Impaired Waters List.

The bar graph shows the percent violation rate for stream samples collected annually that did not meet the water quality standard of 235 cfu/100 mL. The number of samples that were collected each year is shown above each bar within the graph. A linear trend fitted to the data of Little Sandy River shows significant decreasing trend in the violation rate over the sampling period.



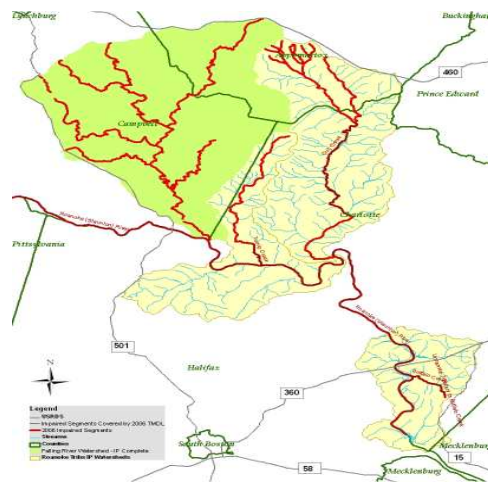
**Spring, Briery, Saylers Creeks & Bush and Little Sandy Rivers  
BMP Summary: 2006-2013**

Practice Code	Extent Installed	Unit
CRFR-3	170	Acres
CRSL-6	38,212	Lin. Feet
FR-1	339	Acres
LE-1T	70,247	Lin. Feet
LE-2T	1,700	Lin. Feet
SL-1	218	Acres
SL-6	65,841	Lin. Feet
SL-6T	10,237	Lin. Feet
SL-7T	23	Acres
SL-8B	1,202	Acres
SL-8H	1,030	Acres
SL-10T	47	Acres
SL-11	4	Acres
WP-1	1	Count
WP-2	2,993	Lin. Feet
WP-2T	10,994	Lin. Feet
WP-4C	1	System
WP-4B	1	System



## State Project Report - State Project Report - Cub, Turnip and Buffalo Creeks TMDL Implementation Project

The Cub, Turnip and Buffalo Creeks implementation project for bacteria impairments was initiated in 2006. DCR contracted with the Robert E. Lee and Southside Soil and Water Conservation Districts (SWCD) and provided funding from the Water Quality Improvement Fund (WQIF) towards project implementation. The BMPs implemented and cost-share amounts paid by each district are noted separately. The project is now in its seventh year of the implementation of various agricultural BMPs. This project was awarded additional funding as of July 1, 2012 for the Appomattox County portion only (Robert E. Lee SWCD). The tables below list all BMPs implemented within the period of 2006 through June 2013. These BMPs were funded with state WQIF/VNRFC targeted TMDL cost-share funds. The total cost-share payments for these BMPs were \$673,794 (\$543,806 through Southside SWCD and \$129,988 through Robert E. Lee SWCD). The change in water quality reflects the cumulative impact of all BMPs implemented in the watersheds.



**Cub, Turnip, and Buffalo Creeks Southside  
SWCD BMP Summary: 2006-2013**

SWCD	Practice	Extent	Extent
Southside	CCI-CNT	25	Acres
	CCI-SE1	1,620	Lin. Feet
	FR-1	105	Acres
	LE-1T	22,143	Lin. Feet
	SL-1	70	Acres
	SL-6	64,536	Lin. Feet
	SL-15A	53	Acres
	SL-3	12	Acres
	SL-8B	63	Acres
	WP-4B	1	System
	WP-4F	1	Facility
R.E. Lee	CRSL-6	4,100	Lin. Feet
	FR-1	27	Acres
	LE-1T	12,800	Lin. Feet
	SL-6	5,600	Lin. Feet
	SL-8B	47	Acres

The stream fencing by Southside SWCD has been installed through the TMDL fencing practices LE-1T (22,143 linear feet) and SL-6 (64,536), and CCI-SE1 voluntary practice (1,620 linear feet). Robert E. Lee stream fencing has been installed through the USDA Conservation Reserve Enhancement Program, CRSL-6 (4,100 linear feet), and the TMDL fencing practices: LE-1T (12,800 linear feet) and SL-6 (5,600 linear feet). This totals 21 miles of livestock stream exclusion fencing installed.

The *E. coli* bacteria standard that became effective in 2003 is the standard that has to be met to remove Cub, Turnip and Buffalo Creeks from the Impaired Waters List.

### **State Project Report: Southern Rivers Livestock Exclusion Initiative TMDL Implementation Project**

The Southern Rivers Livestock Exclusion Initiative project was initiated in 2012. DCR contracted with the Halifax, Patrick, and Pittsylvania Soil & Water Conservation Districts and provided Virginia Natural Resources Commitment Funds towards the implementation of stream fencing practices. The project is focusing on implementing stream exclusion BMPs in the Upper Banister River & Tributaries (Pittsylvania County); Lower Banister River and Polecat Creek (Halifax County), and North Fork, South Fork and mainstem of the Mayo River (Patrick County). All three watershed areas have completed TMDL implementation plans for streams impaired due to bacteria. The table below lists all BMPs implemented in the project area within the period of July 1, 2012 through June 30, 2013. The total cost-share payments for these BMPs were \$115,276.

The stream fencing practices installed included: LE-1T (4,162 linear feet), and SL-6T (5,200 linear feet) which total 1.8 miles of stream fencing.

#### **Southern Rivers Livestock Exclusion, 2012-2013**

<b>Practice Code</b>	<b>Extent Installed</b>	<b>Unit</b>
LE-1T	4,162	Lin. Feet
SL-6T	5,200	Lin. Feet

## **Glossary of Acronyms**

BMP – Best Management Practice  
CB – Chesapeake Bay  
CD – Consent Decree  
CFU – Colony Forming Units  
CREP – Conservation Reserve Enhancement Program  
DCR – Department of Conservation and Recreation  
DEQ – Department of Environmental Quality  
DMME – Department of Mines, Minerals and Energy  
DOT – Department of Transportation  
EPA – U.S. Environmental Protection Agency  
FY – Virginia Fiscal Year  
FFY – Federal Fiscal Year  
GA – General Assembly  
NPS – Nonpoint Source  
NRCS – USDA Natural Resources Conservation Service  
SR – Southern Rivers  
SWCD – Soil and Water Conservation District  
TMDL – Total Maximum Daily Load  
TMDL IP – Total Maximum Daily Load Implementation Plan  
USDA – United States Department of Agriculture  
VSMP – Virginia Stormwater Management Program  
VNRFCF – Virginia Natural Resources Commitment Fund  
WIP – Watershed Implementation Plan  
WQIF – Water Quality Improvement Fund

